(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 July 2005 (28.07.2005)

PCT

(10) International Publication Number
WO 2005/067667 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2005/000638

(22) International Filing Date: 7 January 2005 (07.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/535,151 7 January 2004 (07.01.2004) US

(71) Applicant *(for all designated States except US)*: **BRISTOL-MYERS SQUIBB COMPANY** [US/US]; Route 206 and Province Line Road, Princeton, NJ 08543-4000 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **CLARK, Edwin, A.** [US/US]; 133 Brandon Road, Pennington, NJ 08534 (US). **FORD, Shirin, K.** [IN/US]; 45 Jackson Avenue, Princeton, NJ 08540 (US). **YOGANATHAN, Suganthy** [LK/US]; 53 Victoria Drive, Somerset, NJ 08873 (US). **JACKSON, Donald, G.** [US/US]; 2617 Main Street, Apt. 2, Lawrenceville, NJ 08648 (US).

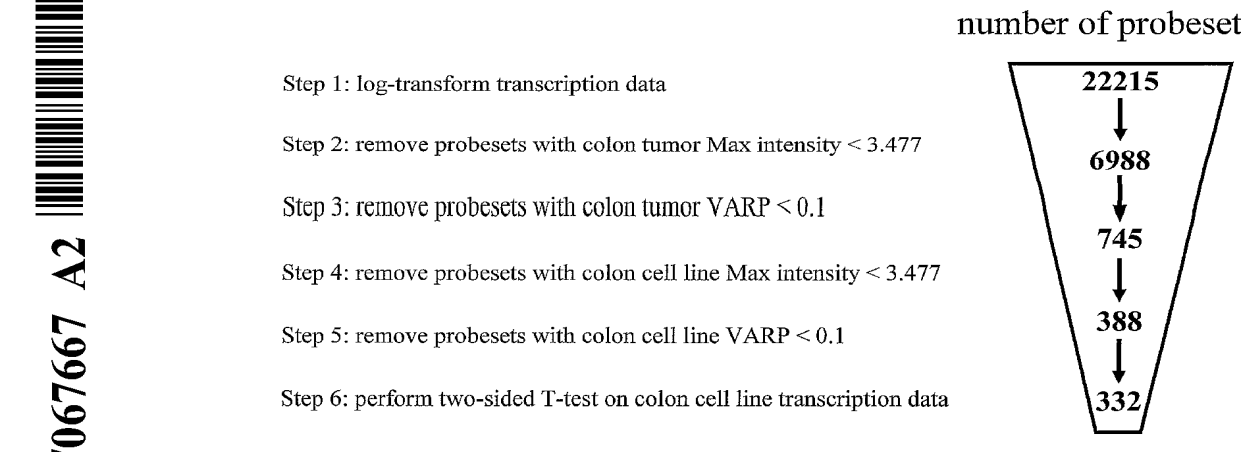
(74) Agents: **GOLIAN, Paul, D.** et al.; Bristol-Myers Squibb Company, P.O. Box 4000, Princeton, NJ 08543-4000 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: BIOMARKERS AND METHODS FOR DETERMINING SENSITIVITY TO EPIDERMAL GROWTH FACTOR RECEPTOR MODULATORS



(57) Abstract: EGFR biomarkers useful in a method for identifying a mammal that will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises (a) exposing the mammal to the EGFR modulator and (b) measuring in the mammal the level of the at least one biomarker, wherein a difference in the level of the at least one biomarker measured in (b) compared to the level of the biomarker in a mammal that has not been exposed to the EGFR modulator indicates that the mammal will respond therapeutically to the method of treating cancer.

WO 2005/067667 A2

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

BIOMARKERS AND METHODS FOR DETERMINING SENSITIVITY TO EPIDERMAL GROWTH FACTOR RECEPTOR MODULATORS

FIELD OF THE INVENTION

The present invention relates generally to the field of pharmacogenomics, and more specifically to methods and procedures to determine sensitivity in patients to allow the development of individualized genetic profiles which aid in treating diseases and disorders based on patient response at a molecular level.

BACKGROUND OF THE INVENTION:

Cancer is a disease with extensive histoclinical heterogeneity. Although conventional histological and clinical features have been correlated to prognosis, the same apparent prognostic type of tumors varies widely in its responsiveness to therapy and consequent survival of the patient.

New prognostic and predictive markers, which would facilitate an individualization of therapy for each patient, are needed to accurately predict patient response to treatments, such as small molecule or biological molecule drugs, in the clinic. The problem may be solved by the identification of new parameters that could better predict the patient's sensitivity to treatment. The classification of patient samples is a crucial aspect of cancer diagnosis and treatment. The association of a patient's response to a treatment with molecular and genetic markers can open up new opportunities for treatment development in non-responding patients, or distinguish a treatment's indication among other treatment choices because of higher confidence in the efficacy. Further, the pre-selection of patients who are likely to respond well to a medicine, drug, or combination therapy may reduce the number of patients needed in a clinical study or accelerate the time needed to complete a clinical development program (M. Cockett et al., 2000, *Current Opinion in Biotechnology*, 11:602-609).

The ability to predict drug sensitivity in patients is particularly challenging because drug responses reflect not only properties intrinsic to the target cells, but also a host's metabolic properties. Efforts to use genetic information to predict drug sensitivity have primarily focused on individual genes that have broad effects, such as the multidrug resistance genes, *mdr1* and *mrp1* (P. Sonneveld, 2000, *J. Intern. Med.*, 247:521-534).

The development of microarray technologies for large scale characterization of gene mRNA expression pattern has made it possible to systematically search for molecular markers and to categorize cancers into distinct subgroups not evident by traditional histopathological methods (J. Khan et al., 1998, *Cancer Res.*, 58:5009-5013; A.A. Alizadeh et al., 2000, *Nature*, 403:503-511; M. Bittner et al., 2000, *Nature*, 406:536-540; J. Khan et al., 2001, *Nature Medicine*, 7(6):673-679; and T.R. Golub et al., 1999, *Science*, 286:531-537; U. Alon et al., 1999, *Proc. Natl. Acad. Sci. USA,* 96:6745-6750). Such technologies and molecular tools have made it possible to monitor the expression level of a large number of transcripts within a cell population at any given time (see, e.g., Schena et al., 1995, *Science*, 270:467-470; Lockhart et al., 1996, *Nature Biotechnology*, 14:1675-1680; Blanchard et al., 1996, *Nature Biotechnology*, 14:1649; U.S. Patent No. 5,569,588 to Ashby et al.).

Recent studies demonstrate that gene expression information generated by microarray analysis of human tumors can predict clinical outcome (L.J. van't Veer et al., 2002, *Nature*, 415:530-536; M. West et al., 2001, *Proc. Natl. Acad. Sci. USA,* 98:11462-11467; T. Sorlie et al., 2001, *Proc. Natl. Acad. Sci. USA,* 98:10869-10874; M. Shipp et al., 2002, *Nature Medicine*, 8(1):68-74). These findings bring hope that cancer treatment will be vastly improved by better predicting the response of individual tumors to therapy.

Needed are new and alternative methods and procedures to determine drug sensitivity in patients to allow the development of individualized genetic profiles which are necessary to treat diseases and disorders based on patient response at a molecular level.

SUMMARY OF THE INVENTION:

The invention provides methods and procedures for determining patient sensitivity to one or more Epidermal Growth Factor Receptor (EGFR) modulators. The invention also provides methods of determining or predicting whether an individual requiring therapy for a disease state such as cancer will or will not respond to treatment, prior to administration of the treatment, wherein the treatment comprises one or more EGFR modulators. The one or more EGFR modulators are compounds that can be selected from, for example, one or more EGFR specific ligands, one or

more small molecule EGFR inhibitors, or one or more EGFR binding monoclonal antibodies.

In one aspect, the invention provides a method for identifying a mammal that will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises: (a) measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1; (b) exposing the mammal to the EGFR modulator; (c) following the exposing of step (b), measuring in the mammal the level of the at least one biomarker, wherein a difference in the level of the at least one biomarker measured in step (c) compared to the level of the at least one biomarker measured in step (a) indicates that the mammal will respond therapeutically to said method of treating cancer.

As used herein, respond therapeutically refers to the alleviation or abrogation of the cancer. This means that the life expectancy of an individual affected with the cancer will be increased or that one or more of the symptoms of the cancer will be reduced or ameliorated. The term encompasses a reduction in cancerous cell growth or tumor volume. Whether a mammal responds therapeutically can be measured by many methods well known in the art, such as PET imaging.

The mammal can be, for example, a human, rat, mouse, dog rabbit, pig sheep, cow, horse, cat, primate, or monkey.

The method of the invention can be, for example, an in vitro method and wherein the at least one biomarker is measured in at least one mammalian biological sample from the mammal. The biological sample can comprise, for example, at least one of whole fresh blood, peripheral blood mononuclear cells, frozen whole blood, fresh plasma, frozen plasma, urine, saliva, skin, hair follicle, or tumor tissue.

In another aspect, the invention provides a method for identifying a mammal that will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises: (a) exposing the mammal to the EGFR modulator; (b) following the exposing of step (a), measuring in the mammal the level of the at least one biomarker selected from the biomarkers of Table 1, wherein a difference in the level of the at least one biomarker measured in step (b), compared to the level of the biomarker in a mammal that has not been

exposed to said EGFR modulator, indicates that the mammal will respond therapeutically to said method of treating cancer.

In yet another aspect, the invention provides a method for testing or predicting whether a mammal will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises: (a) measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1; (b) exposing the mammal to the EGFR modulator; (c) following the exposing of step (b), measuring in the mammal the level of the at least one biomarker, wherein a difference in the level of the at least one biomarker measured in step (c) compared to the level of the at least one biomarker measured in step (a) indicates that the mammal will respond therapeutically to said method of treating cancer.

In another aspect, the invention provides a method for determining whether a compound inhibits EGFR activity in a mammal, comprising: (a) exposing the mammal to the compound; and (b) following the exposing of step (a), measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1, wherein a difference in the level of said biomarker measured in step (b), compared to the level of the biomarker in a mammal that has not been exposed to said compound, indicates that the compound inhibits EGFR activity in the mammal.

In yet another aspect, the invention provides a method for determining whether a mammal has been exposed to a compound that inhibits EGFR activity, comprising (a) exposing the mammal to the compound; and (b) following the exposing of step (a), measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1, wherein a difference in the level of said biomarker measured in step (b), compared to the level of the biomarker in a mammal that has not been exposed to said compound, indicates that the mammal has been exposed to a compound that inhibits EGFR activity.

In another aspect, the invention provides a method for determining whether a mammal is responding to a compound that inhibits EGFR activity, comprising (a) exposing the mammal to the compound; and (b) following the exposing of step (a), measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1, wherein a difference in the level of said biomarker measured

in step (b), compared to the level of the biomarker in a mammal that has not been exposed to said compound, indicates that the mammal is responding to the compound that inhibits EGFR activity.

As used herein, "responding" encompasses responding by way of a biological and cellular response, as well as a clinical response (such as improved symptoms, a therapeutic effect, or an adverse event), in a mammal

The invention also provides an isolated biomarker selected from the biomarkers of Table 1. The biomarkers of the invention comprise sequences selected from the nucleotide and amino acid sequences provided in Table 1 and the Sequence Listing, as well as fragments and variants thereof.

The invention also provides a biomarker set comprising two or more biomarkers selected from the biomarkers of Table 1.

The invention also provides kits for determining or predicting whether a patient would be susceptible or resistant to a treatment that comprises one or more EGFR modulators. The patient may have a cancer or tumor such as, for example, a colon cancer or tumor.

In one aspect, the kit comprises a suitable container that comprises one or more specialized microarrays of the invention, one or more EGFR modulators for use in testing cells from patient tissue specimens or patient samples, and instructions for use. The kit may further comprise reagents or materials for monitoring the expression of a biomarker set at the level of mRNA or protein.

In another aspect, the invention provides a kit comprising two or more biomarkers selected from the biomarkers of Table 1.

In yet another aspect, the invention provides a kit comprising at least one of an antibody and a nucleic acid for detecting the presence of at least one of the biomarkers selected from the biomarkers of Table 1. In one aspect, the kit further comprises instructions for determining whether or not a mammal will respond therapeutically to a method of treating cancer comprising administering a compound that inhibits EGFR activity. In another aspect, the instructions comprise the steps of (a) measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1, (b) exposing the mammal to the compound, (c) following the exposing of step (b), measuring in the mammal the level of the at least one biomarker,

wherein a difference in the level of the at least one biomarker measured in step (c) compared to the level of the at least one biomarker measured in step (a) indicates that the mammal will respond therapeutically to said method of treating cancer.

The invention also provides screening assays for determining if a patient will be susceptible or resistant to treatment with one or more EGFR modulators.

The invention also provides a method of monitoring the treatment of a patient having a disease treatable by one or more EGFR modulators.

The invention also provides individualized genetic profiles which are necessary to treat diseases and disorders based on patient response at a molecular level.

The invention also provides specialized microarrays, e.g., oligonucleotide microarrays or cDNA microarrays, comprising one or more biomarkers having expression profiles that correlate with either sensitivity or resistance to one or more EGFR modulators.

The invention also provides antibodies, including polyclonal or monoclonal, directed against one or more biomarkers of the invention.

The invention will be better understood upon a reading of the detailed description of the invention when considered in connection with the accompanying figures.

BRIEF DESCRIPTION OF THE FIGURES:

FIG. 1 illustrates the gene filtering process.

FIG. 2 illustrates the cell line filtering process.

FIG. 3 illustrates the cell line IC50 data.

FIG. 4 illustrates the T-test Results I.

FIG. 5 illustrates the T-test Results II.

FIG. 6 illustrates the T-test Results III.

DETAILED DESCRIPTION OF THE INVENTION:

The invention provides biomarkers that respond to the modulation of a specific signal transduction pathway and also correlate with EGFR modulator sensitivity or resistance. These biomarkers can be employed for predicting response

to one or more EGFR modulators. In one aspect, the biomarkers of the invention are those provided in Table 1 and the Sequence Listing, including both polynucleotide and polypeptide sequences.

TABLE 1 - BIOMARKERS

Unigene title and SEQ ID NOS:	**Affymetrix Description**	**Affymetrix Probe Set**
Cadherin 17, LI cadherin (liver-intestine) SEQ ID NOS:1 (nucleotide) and 67 (amino acid)	gb:U07969.1 /DEF=Human intestinal peptide-associated transporter HPT-1 mRNA, complete cds. /FEA=mRNA /PROD=intestinal peptide-associated transporter HPT-1 /DB_XREF=gi:483391 /UG=Hs.89436 cadherin 17, LI cadherin (liver-intestine) /FL=gb:NM_004063.1 gb:U07969.1	209847_at
Carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen) SEQ ID NOS:2 (nucleotide) and 68 (amino acid)	gb:BC005008.1 /DEF=Homo sapiens, carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen), clone MGC:10467, mRNA, complete cds. /FEA=mRNA /PROD=carcinoembryonic antigen-related cell adhesionmolecule 6 (non-specific cross reacting antigen) /DB_XREF=gi:13477106 /UG=Hs.73848 carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen) /FL=gb:BC005008.1 gb:M18216.1 gb:M29541.1 gb:NM_002483.1	203757_s_at
Carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen) SEQ ID NOS:3 (nucleotide) and 69 (amino acid)	gb:M18728.1 /DEF=Human nonspecific crossreacting antigen mRNA, complete cds. /FEA=mRNA /GEN=NCA; NCA; NCA /PROD=non-specific cross reacting antigen /DB_XREF=gi:189084 /FL=gb:M18728.1	211657_at
Lectin, galactoside-binding, soluble, 1 (galectin 1) SEQ ID NOS:4 (nucleotide) and 70 (amino acid)	gb:NM_002305.2 /DEF=Homo sapiens lectin, galactoside-binding, soluble, 1 (galectin 1) (LGALS1), mRNA. /FEA=mRNA /GEN=LGALS1 /PROD=beta-galactosidase binding lectin precursor /DB_XREF=gi:6006015 /UG=Hs.227751 lectin, galactoside-binding, soluble, 1 (galectin 1)	201105_at

	/FL=gb:BC001693.1 gb:J04456.1 gb:NM_002305.2	
Transmembrane protease, serine 2 SEQ ID NOS:5 (nucleotide) and 71 (amino acid)	gb:AF270487.1 /DEF=Homo sapiens androgen-regulated serine protease TMPRSS2 precursor (TMPRSS2) mRNA, complete cds. /FEA=mRNA /GEN=TMPRSS2 /PROD=androgen-regulated serine protease TMPRSS2precursor /DB_XREF=gi:13540003 /FL=gb:AF270487.1	211689_s_at
Mucin 5, subtypes A and C, tracheobronchial/gastric SEQ ID NOS:6 (nucleotide), 7 (nucleotide) and 72 (amino acid)	Consensus includes gb:AW192795 /FEA=EST /DB_XREF=gi:6471494 /DB_XREF=est:xl51d08.x1 /CLONE=IMAGE:2678223 /UG=Hs.103707 apomucin	214303_x_at
3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2 (mitochondrial) SEQ ID NOS:8 (nucleotide) and 73 (amino acid)	gb:NM_005518.1 /DEF=Homo sapiens 3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2 (mitochondrial) (HMGCS2), mRNA. /FEA=mRNA /GEN=HMGCS2 /PROD=3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2(mitochondrial) /DB_XREF=gi:5031750 /UG=Hs.59889 3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2 (mitochondrial) /FL=gb:NM_005518.1	204607_at
Interferon-stimulated protein, 15 kDa SEQ ID NOS:9 (nucleotide) and 74 (amino acid)	gb:NM_005101.1 /DEF=Homo sapiens interferon-stimulated protein, 15 kDa (ISG15), mRNA. /FEA=mRNA /GEN=ISG15 /PROD=interferon-stimulated protein, 15 kDa /DB_XREF=gi:4826773 /UG=Hs.833 interferon-stimulated protein, 15 kDa /FL=gb:M13755.1 gb:NM_005101.1	205483_s_at
Dopa decarboxylase (aromatic L-amino acid decarboxylase) SEQ ID NOS:10 (nucleotide) and 75 (amino acid)	gb:NM_000790.1 /DEF=Homo sapiens dopa decarboxylase (aromatic L-amino acid decarboxylase) (DDC), mRNA. /FEA=mRNA /GEN=DDC /PROD=dopa decarboxylase (aromatic L-amino aciddecarboxylase) /DB_XREF=gi:4503280 /UG=Hs.150403 dopa decarboxylase (aromatic L-amino acid decarboxylase) /FL=gb:BC000485.1 gb:M76180.1 gb:M88700.1 gb:NM_000790.1	205311_at

Serine (or cysteine) proteinase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 SEQ ID NOS:11 (nucleotide) and 76 (amino acid)	gb:NM_000602.1 /DEF=Homo sapiens serine (or cysteine) proteinase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 (SERPINE1), mRNA. /FEA=mRNA /GEN=SERPINE1 /PROD=serine (or cysteine) proteinase inhibitor, cladeE (nexin, plasminogen activator inhibitor type 1), member1 /DB_XREF=gi:10835158 /UG=Hs.82085 serine (or cysteine) proteinase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 /FL=gb:NM_000602.1 gb:M16006.1	202628_s_at
FXYD domain-containing ion transport regulator 3 SEQ ID NOS:12 (nucleotide) and 77 (amino acid)	gb:BC005238.1 /DEF=Homo sapiens, FXYD domain-containing ion transport regulator 3, clone MGC:12265, mRNA, complete cds. /FEA=mRNA /PROD=FXYD domain-containing ion transport regulator3 /DB_XREF=gi:13528881 /UG=Hs.301350 FXYD domain-containing ion transport regulator 3 /FL=gb:NM_005971.2 gb:BC005238.1	202489_s_at
Putative integral membrane transporter SEQ ID NOS:13 (nucleotide) and 78 (amino acid)	gb:NM_018407.1 /DEF=Homo sapiens putative integral membrane transporter (LC27), mRNA. /FEA=mRNA /GEN=LC27 /PROD=putative integral membrane transporter /DB_XREF=gi:8923827 /FL=gb:NM_018407.1	208029_s_at
Protease inhibitor 3, skin-derived (SKALP) SEQ ID NOS:14 (nucleotide) and 79 (amino acid)	gb:NM_002638.1 /DEF=Homo sapiens protease inhibitor 3, skin-derived (SKALP) (PI3), mRNA. /FEA=mRNA /GEN=PI3 /PROD=protease inhibitor 3, skin-derived (SKALP) /DB_XREF=gi:4505786 /UG=Hs.112341 protease inhibitor 3, skin-derived (SKALP) /FL=gb:NM_002638.1	203691_at
Caudal type homeo box transcription factor 2 SEQ ID NOS:15 (nucleotide) and 80 (amino acid)	gb:U51096.1 /DEF=Human homeobox protein Cdx2 mRNA, complete cds. /FEA=mRNA /PROD=homeobox protein Cdx2 /DB_XREF=gi:1777773 /UG=Hs.77399 caudal type homeo box transcription factor 2 /FL=gb:U51096.1 gb:NM_001265.1	206387_at
Fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism)	gb:NM_000142.2 /DEF=Homo sapiens fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism) (FGFR3), transcript variant 1, mRNA.	204379_s_at

SEQ ID NOS:16 (nucleotide) and 81 (amino acid)	/FEA=mRNA /GEN=FGFR3 /PROD=fibroblast growth factor receptor 3, isoform 1precursor /DB_XREF=gi:13112046 /UG=Hs.1420 fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism) /FL=gb:NM_000142.2 gb:M58051.1	
Hypothetical protein PP1665 SEQ ID NOS:17 (nucleotide), 18 (nucleotide) and 82 (amino acid)	Consensus includes gb:AL041124 /FEA=EST /DB_XREF=gi:5410060 /DB_XREF=est:DKFZp434D0316_s1 /CLONE=DKFZp434D0316 /UG=Hs.6748 hypothetical protein PP1665	213343_s_at
Protease inhibitor 3, skin-derived (SKALP) SEQ ID NOS:19 (nucleotide) and 83 (amino acid)	Cluster Incl. L10343:Huma elafin gene, complete cds /cds=(516,869) /gb=L10343 /gi=190337 /ug=Hs.112341 /len=871	41469_at
A kinase (PRKA) anchor protein (gravin) 12 SEQ ID NOS:20 (nucleotide) and 84 (amino acid)	gb:AB003476.1 /DEF=Homo sapiens mRNA for gravin, complete cds. /FEA=mRNA /PROD=gravin /DB_XREF=gi:2081606 /UG=Hs.788 A kinase (PRKA) anchor protein (gravin) 12 /FL=gb:AB003476.1	210517_s_at
Lymphocyte antigen 75 SEQ ID NOS:21 (nucleotide) and 85 (amino acid)	gb:NM_002349.1 /DEF=Homo sapiens lymphocyte antigen 75 (LY75), mRNA. /FEA=mRNA /GEN=LY75 /PROD=lymphocyte antigen 75 /DB_XREF=gi:4505052 /UG=Hs.153563 lymphocyte antigen 75 /FL=gb:AF011333.1 gb:AF064827.1 gb:NM_002349.1	205668_at
Mucin 5, subtypes A and C, tracheobronchial/gastric SEQ ID NOS:22 (nucleotide)	Consensus includes gb:AI521646 /FEA=EST /DB_XREF=gi:4435781 /DB_XREF=est:to66a06.x1 /CLONE=IMAGE:2183218 /UG=Hs.102482 mucin 5, subtype B, tracheobronchial	214385_s_at
Metallothionein 1G SEQ ID NOS:23 (nucleotide) and 86 (amino acid)	gb:NM_005950.1 /DEF=Homo sapiens metallothionein 1G (MT1G), mRNA. /FEA=mRNA /GEN=MT1G /PROD=metallothionein 1G /DB_XREF=gi:10835229 /UG=Hs.173451 metallothionein 1G /FL=gb:NM_005950.1	204745_x_at
Tumor necrosis factor	gb:NM_003823.1 /DEF=Homo sapiens	206467_x_at

receptor superfamily, member 6b, decoy SEQ ID NOS:24 (nucleotide) and 87 (amino acid)	tumor necrosis factor receptor superfamily, member 6b, decoy (TNFRSF6B), mRNA. /FEA=mRNA /GEN=TNFRSF6B /PROD=decoy receptor 3 /DB_XREF=gi:4507584 /UG=Hs.278556 tumor necrosis factor receptor superfamily, member 6b, decoy /FL=gb:AF104419.1 gb:NM_003823.1 gb:AF134240.1 gb:AF217794.1	
Mucin 3B SEQ ID NOS:25 (nucleotide) and 88 (amino acid)	Consensus includes gb:AB038783.1 /DEF=Homo sapiens MUC3B mRNA for intestinal mucin, partial cds. /FEA=mRNA /GEN=MUC3B /PROD=intestinal mucin /DB_XREF=gi:9929917 /UG=Hs.129782 mucin 3A, intestinal	214898_x_at
Metallothionein 1X SEQ ID NOS:26 (nucleotide) and 89 (amino acid)	gb:NM_005952.1 /DEF=Homo sapiens metallothionein 1X (MT1X), mRNA. /FEA=CDS /GEN=MT1X /PROD=metallothionein 1X /DB_XREF=gi:10835231 /UG=Hs.278462 metallothionein 1X /FL=gb:NM_005952.1	208581_x_at
GRO3 oncogene SEQ ID NOS:27 (nucleotide) and 90 (amino acid)	gb:NM_002090.1 /DEF=Homo sapiens GRO3 oncogene (GRO3), mRNA. /FEA=mRNA /GEN=GRO3 /PROD=GRO3 oncogene /DB_XREF=gi:4504156 /UG=Hs.89690 GRO3 oncogene /FL=gb:M36821.1 gb:NM_002090.1	207850_at
Transforming growth factor, beta-induced, 68kD SEQ ID NOS:28 (nucleotide) and 91 (amino acid)	gb:NM_000358.1 /DEF=Homo sapiens transforming growth factor, beta-induced, 68kD (TGFBI), mRNA. /FEA=mRNA /GEN=TGFBI /PROD=transforming growth factor, beta-induced, 68kD /DB_XREF=gi:4507466 /UG=Hs.118787 transforming growth factor, beta-induced, 68kD /FL=gb:BC000097.1 gb:BC004972.1 gb:M77349.1 gb:NM_000358.1	201506_at
Bone morphogenetic protein 7 (osteogenic protein 1) SEQ ID NOS:29 (nucleotide) and 92 (amino acid)	gb:M60316.1 /DEF=Human transforming growth factor-beta (tgf-beta) mRNA, complete cds. /FEA=mRNA /GEN=tgf-beta /PROD=transforming growth factor-beta /DB_XREF=gi:339563 /UG=Hs.170195 bone morphogenetic protein 7 (osteogenic protein 1) /FL=gb:M60316.1 gb:NM_001719.1	209591_s_at
Annexin A10 SEQ ID NOS:30	gb:AF196478.1 /DEF=Homo sapiens annexin 14 (ANX14) mRNA, complete cds. /FEA=mRNA /GEN=ANX14	210143_at

(nucleotide) and 93 (amino acid)	/PROD=annexin 14 /DB_XREF=gi:6274496 /UG=Hs.188401 annexin A10 /FL=gb:AF196478.1 gb:NM_007193.2	
Metallothionein 1F (functional) SEQ ID NOS:31 (nucleotide) and 94 (amino acid)	Consensus includes gb:M10943 /DEF=Human metallothionein-If gene (hMT-If) /FEA=CDS /DB_XREF=gi:187540 /UG=Hs.203936 metallothionein 1F (functional)	217165_x_at
Annexin A1 SEQ ID NOS:32 (nucleotide) and 95 (amino acid)	gb:NM_000700.1 /DEF=Homo sapiens annexin A1 (ANXA1), mRNA. /FEA=mRNA /GEN=ANXA1 /PROD=annexin I /DB_XREF=gi:4502100 /UG=Hs.78225 annexin A1 /FL=gb:BC001275.1 gb:NM_000700.1	201012_at
Secretory leukocyte protease inhibitor (antileukoproteinase) SEQ ID NOS:33 (nucleotide) and 96 (amino acid)	gb:NM_003064.1 /DEF=Homo sapiens secretory leukocyte protease inhibitor (antileukoproteinase) (SLPI), mRNA. /FEA=mRNA /GEN=SLPI /PROD=secretory leukocyte protease inhibitor(antileukoproteinase) /DB_XREF=gi:4507064 /UG=Hs.251754 secretory leukocyte protease inhibitor (antileukoproteinase) /FL=gb:NM_003066.1 gb:AF114471.1 gb:NM_003064.1	203021_at
Polymeric immunoglobulin receptor SEQ ID NOS:34 (nucleotide) and 97 (amino acid)	gb:NM_002644.1 /DEF=Homo sapiens polymeric immunoglobulin receptor (PIGR), mRNA. /FEA=mRNA /GEN=PIGR /PROD=polymeric immunoglobulin receptor /DB_XREF=gi:11342673 /UG=Hs.288579 polymeric immunoglobulin receptor /FL=gb:NM_002644.1	204213_at
Carcinoembryonic antigen-related cell adhesion molecule 5 SEQ ID NOS:35 (nucleotide) and 98 (amino acid)	gb:NM_004363.1 /DEF=Homo sapiens carcinoembryonic antigen-related cell adhesion molecule 5 (CEACAM5), mRNA. /FEA=mRNA /GEN=CEACAM5 /PROD=carcinoembryonic antigen-related cell adhesionmolecule 5 /DB_XREF=gi:11386170 /UG=Hs.220529 carcinoembryonic antigen-related cell adhesion molecule 5 /FL=gb:NM_004363.1 gb:M29540.1	201884_at
Protein tyrosine phosphatase, receptor type, N polypeptide 2	gb:NM_002847.1 /DEF=Homo sapiens protein tyrosine phosphatase, receptor type, N polypeptide 2 (PTPRN2), mRNA.	203029_s_at

SEQ ID NOS:36 (nucleotide) and 99 (amino acid)	/FEA=mRNA /GEN=PTPRN2 /PROD=protein tyrosine phosphatase, receptor type, Npolypeptide 2 /DB_XREF=gi:11386148 /UG=Hs.74624 protein tyrosine phosphatase, receptor type, N polypeptide 2 /FL=gb:NM_002847.1 gb:U66702.1 gb:AF007555.1	
Cystic fibrosis transmembrane conductance regulator, ATP-binding cassette (sub-family C, member 7) SEQ ID NOS:37 (nucleotide) and 100 (amino acid)	gb:NM_000492.2 /DEF=Homo sapiens cystic fibrosis transmembrane conductance regulator, ATP-binding cassette (sub-family C, member 7) (CFTR), mRNA. /FEA=mRNA /GEN=CFTR /PROD=cystic fibrosis transmembrane conductanceregulator, ATP-binding cassette (sub-family C, member 7) /DB_XREF=gi:6995995 /UG=Hs.663 cystic fibrosis transmembrane conductance regulator, ATP-binding cassette (sub-family C, member 7) /FL=gb:NM_000492.2	205043_at
DVS27-related protein SEQ ID NOS:38 (nucleotide) and 101 (amino acid)	gb:AB024518.1 /DEF=Homo sapiens mRNA for DVS27-related protein, complete cds. /FEA=mRNA /GEN=DVS27 /PROD=DVS27-related protein /DB_XREF=gi:4520327 /UG=Hs.58589 glycogenin 2 /FL=gb:AB024518.1	209821_at
Insulin-like growth factor binding protein 2 (36kD) SEQ ID NOS:39 (nucleotide) and 102 (amino acid)	gb:NM_000597.1 /DEF=Homo sapiens insulin-like growth factor binding protein 2 (36kD) (IGFBP2), mRNA. /FEA=mRNA /GEN=IGFBP2 /PROD=insulin-like growth factor binding protein 2(36kD) /DB_XREF=gi:10835156 /UG=Hs.162 insulin-like growth factor binding protein 2 (36kD) /FL=gb:NM_000597.1 gb:BC004312.1 gb:M35410.1	202718_at
Inhibitor of DNA binding 3, dominant negative helix-loop-helix protein SEQ ID NOS:40 (nucleotide) and 103 (amino acid)	gb:NM_002167.1 /DEF=Homo sapiens inhibitor of DNA binding 3, dominant negative helix-loop-helix protein (ID3), mRNA. /FEA=mRNA /GEN=ID3 /PROD=inhibitor of DNA binding 3, dominant negativehelix-loop-helix protein /DB_XREF=gi:10835060 /UG=Hs.76884 inhibitor of DNA binding 3, dominant negative helix-loop-helix protein /FL=gb:NM_002167.1	207826_s_at
Phospholipase A2, group IIA (platelets,	Consensus includes gb:X00452.1 /DEF=Human mRNA for DC classII	203649_s_at

synovial fluid) SEQ ID NOS:41 (nucleotide) and 104 (amino acid)	histocompatibility antigen alpha-chain. /FEA=mRNA /PROD=DC classII histocompatibility antigenalpha-chain /DB_XREF=gi:32265 /UG=Hs.198253 major histocompatibility complex, class II, DQ alpha 1	
Purkinje cell protein 4 SEQ ID NOS:42 (nucleotide) and 105 (amino acid)	gb:NM_006198.1 /DEF=Homo sapiens Purkinje cell protein 4 (PCP4), mRNA. /FEA=mRNA /GEN=PCP4 /PROD=Purkinje cell protein 4 /DB_XREF=gi:5453857 /UG=Hs.80296 Purkinje cell protein 4 /FL=gb:U52969.1 gb:NM_006198.1	205549_at
G protein-coupled receptor 49 SEQ ID NOS:43 (nucleotide), 44 (nucleotide) and 106 (amino acid)	Consensus includes gb:AL524520 /FEA=EST /DB_XREF=gi:12788013 /DB_XREF=est:AL524520 /CLONE=CS0DC007YG21 (3 prime) /UG=Hs.285529 G protein-coupled receptor 49	213880_at
Fucosyltransferase 3 (galactoside 3(4)-L-fucosyltransferase, Lewis blood group included) SEQ ID NOS:45 (nucleotide), 46 (nucleotide) and 107 (amino acid)	Consensus includes gb:AW080549 /FEA=EST /DB_XREF=gi:6035701 /DB_XREF=est:xc33a08.x1 /CLONE=IMAGE:2586038 /UG=Hs.169238 fucosyltransferase 3 (galactoside 3(4)-L-fucosyltransferase, Lewis blood group included)	214088_s_at
Interferon, alpha-inducible protein 27 SEQ ID NOS:47 (nucleotide) and 108 (amino acid)	gb:NM_005532.1 /DEF=Homo sapiens interferon, alpha-inducible protein 27 (IFI27), mRNA. /FEA=mRNA /GEN=IFI27 /PROD=interferon, alpha-inducible protein 27 /DB_XREF=gi:5031780 /UG=Hs.278613 interferon, alpha-inducible protein 27 /FL=gb:NM_005532.1	202411_at
Serine (or cysteine) proteinase inhibitor, clade B (ovalbumin), member 5 SEQ ID NOS:48 (nucleotide) and 109 (amino acid)	gb:NM_002639.1 /DEF=Homo sapiens serine (or cysteine) proteinase inhibitor, clade B (ovalbumin), member 5 (SERPINB5), mRNA. /FEA=mRNA /GEN=SERPINB5 /PROD=serine (or cysteine) proteinase inhibitor, cladeB (ovalbumin), member 5 /DB_XREF=gi:4505788 /UG=Hs.55279 serine (or cysteine) proteinase inhibitor, clade B (ovalbumin), member 5	204855_at

	/FL=gb:NM_002639.1 gb:U04313.1	
Homo sapiens CD44 isoform RC (CD44) mRNA, complete cds SEQ ID NOS:49 (nucleotide) and 110 (amino acid)	gb:AF098641.1 /DEF=Homo sapiens CD44 isoform RC (CD44) mRNA, complete cds. /FEA=mRNA /GEN=CD44 /PROD=CD44 isoform RC /DB_XREF=gi:3832517 /UG=Hs.306278 Homo sapiens CD44 isoform RC (CD44) mRNA, complete cds /FL=gb:AF098641.1	210916_s_at
Solute carrier family 7 (cationic amino acid transporter, y+ system), member 8 SEQ ID NOS:50 (nucleotide) and 111 (amino acid)	gb:NM_012244.1 /DEF=Homo sapiens solute carrier family 7 (cationic amino acid transporter, y+ system), member 8 (SLC7A8), mRNA. /FEA=mRNA /GEN=SLC7A8 /PROD=solute carrier family 7 (cationic amino acidtransporter, y+ system), member 8 /DB_XREF=gi:6912669 /UG=Hs.22891 solute carrier family 7 (cationic amino acid transporter, y+ system), member 8 /FL=gb:AB037669.1 gb:AF171669.1 gb:NM_012244.1	202752_x_at
Membrane protein, palmitoylated 1 (55kD) SEQ ID NOS:51 (nucleotide) and 112 (amino acid)	gb:NM_002436.2 /DEF=Homo sapiens membrane protein, palmitoylated 1 (55kD) (MPP1), mRNA. /FEA=mRNA /GEN=MPP1 /PROD=palmitoylated membrane protein 1 /DB_XREF=gi:6006024 /UG=Hs.1861 membrane protein, palmitoylated 1 (55kD) /FL=gb:BC002392.1 gb:M64925.1 gb:NM_002436.2	202974_at
Tumor protein p53 (Li-Fraumeni syndrome) SEQ ID NOS:52 (nucleotide) and 113 (amino acid)	gb:K03199.1 /DEF=Human p53 cellular tumor antigen mRNA, complete cds. /FEA=mRNA /GEN=TP53 /DB_XREF=gi:189478 /UG=Hs.1846 tumor protein p53 (Li-Fraumeni syndrome) /FL=gb:K03199.1	211300_s_at
S100 calcium-binding protein P SEQ ID NOS:53 (nucleotide) and 114 (amino acid)	gb:NM_005980.1 /DEF=Homo sapiens S100 calcium-binding protein P (S100P), mRNA. /FEA=mRNA /GEN=S100P /PROD=S100 calcium-binding protein P /DB_XREF=gi:5174662 /UG=Hs.2962 S100 calcium-binding protein P /FL=gb:NM_005980.1	204351_at
Serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1	gb:AF119873.1 /DEF=Homo sapiens PRO2275 mRNA, complete cds. /FEA=mRNA /PROD=PRO2275 /DB_XREF=gi:7770182 /UG=Hs.297681 serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase,	211429_s_at

SEQ ID NOS:54 (nucleotide) and 115 (amino acid)	antitrypsin), member 1 /FL=gb:AF119873.1	
Eukaryotic translation initiation factor 5A SEQ ID NOS:55 (nucleotide) and 116 (amino acid)	gb:NM_001970.1 /DEF=Homo sapiens eukaryotic translation initiation factor 5A (EIF5A), mRNA. /FEA=mRNA /GEN=EIF5A /PROD=eukaryotic translation initiation factor 5A /DB_XREF=gi:4503544 /UG=Hs.119140 eukaryotic translation initiation factor 5A /FL=gb:BC000751.1 gb:BC001832.1 gb:M23419.1 gb:NM_001970.1	201123_s_at
Old astrocyte specifically induced substance SEQ ID NOS:56 (nucleotide), 57 (nucleotide) and 117 (amino acid)	Consensus includes gb:AF055009.1 /DEF=Homo sapiens clone 24747 mRNA sequence. /FEA=mRNA /DB_XREF=gi:3005731 /UG=Hs.13456 Homo sapiens clone 24747 mRNA sequence	213059_at
UDP glycosyltransferase 1 family, polypeptide A3 SEQ ID NOS:58 (nucleotide) and 118 (amino acid)	gb:NM_019093.1 /DEF=Homo sapiens UDP glycosyltransferase 1 family, polypeptide A3 (UGT1A3), mRNA. /FEA=CDS /GEN=UGT1A3 /PROD=UDP glycosyltransferase 1 family, polypeptideA3 /DB_XREF=gi:13487899 /UG=Hs.326543 UDP glycosyltransferase 1 family, polypeptide A3 /FL=gb:NM_019093.1	208596_s_at
Alpha-2-HS-glycoprotein SEQ ID NOS:59 (nucleotide) and 119 (amino acid)	gb:AF130057.1 /DEF=Homo sapiens clone FLB5539 PRO1454 mRNA, complete cds. /FEA=mRNA /PROD=PRO1454 /DB_XREF=gi:11493420 /UG=Hs.323288 Homo sapiens clone FLB5539 PRO1454 mRNA, complete cds /FL=gb:AF130057.1	210929_s_at
ESTs, Highly similar to A39092 glucuronosyltransferase [H.sapiens] SEQ ID NOS:60 (nucleotide), 61 (nucleotide) and 120 (amino acid)	Consensus includes gb:AV691323 /FEA=EST /DB_XREF=gi:10293186 /DB_XREF=est:AV691323 /CLONE=GKCEWF11 /UG=Hs.2056 UDP glycosyltransferase 1 family, polypeptide A9	215125_s_at
UDP glycosyltransferase 1 family, polypeptide A1	gb:NM_000463.1 /DEF=Homo sapiens UDP glycosyltransferase 1 family, polypeptide A1 (UGT1A1), mRNA. /FEA=mRNA /GEN=UGT1A1	207126_x_at

SEQ ID NOS:62 (nucleotide) and 121 (amino acid)	/PROD=UDP glycosyltransferase 1 family, polypeptideA1 /DB_XREF=gi:8850235 /UG=Hs.278896 UDP glycosyltransferase 1 family, polypeptide A1 /FL=gb:M57899.1 gb:NM_000463.1	
Serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 SEQ ID NOS:63 (nucleotide) and 122 (amino acid)	gb:NM_000295.1 /DEF=Homo sapiens serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 (SERPINA1), mRNA. /FEA=mRNA /GEN=SERPINA1 /PROD=serine (or cysteine) proteinase inhibitor, cladeA (alpha-1 antiproteinase, antitrypsin), member 1 /DB_XREF=gi:4505792 /UG=Hs.297681 serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1 /FL=gb:AF130068.1 gb:M11465.1 gb:K01396.1 gb:NM_000295.1	202833_s_at
Nerve growth factor receptor (TNFRSF16) associated protein 1 SEQ ID NOS:64 (nucleotide) and 123 (amino acid)	gb:NM_014380.1 /DEF=Homo sapiens p75NTR-associated cell death executor; ovarian granulosa cell protein (13kD) (DXS6984E), mRNA. /FEA=mRNA /GEN=DXS6984E /PROD=p75NTR-associated cell death executor; ovariangranulosa cell protein (13kD) /DB_XREF=gi:7657043 /UG=Hs.17775 p75NTR-associated cell death executor; ovarian granulosa cell protein (13kD) /FL=gb:NM_014380.1 gb:AF187064.1	217963_s_at
Collagen, type XVIII, alpha 1 SEQ ID NOS:65 (nucleotide) and 124 (amino acid)	Consensus includes gb:NM_030582.1 /DEF=Homo sapiens collagen, type XVIII, alpha 1 (COL18A1), mRNA. /FEA=CDS /GEN=COL18A1 /PROD=collagen, type XVIII, alpha 1 /DB_XREF=gi:13385619 /UG=Hs.78409 collagen, type XVIII, alpha 1 /FL=gb:NM_030582.1 gb:AF018081.1 gb:AF184060.1 gb:NM_016214.1	209081_s_at
Collagen, type IX, alpha 3 SEQ ID NOS:66 (nucleotide) and 125 (amino acid)	gb:NM_001853.1 /DEF=Homo sapiens collagen, type IX, alpha 3 (COL9A3), mRNA. /FEA=mRNA /GEN=COL9A3 /PROD=collagen, type IX, alpha 3 /DB_XREF=gi:4502966 /UG=Hs.53563 collagen, type IX, alpha 3 /FL=gb:L41162.1 gb:NM_001853.1	204724_s_at

The biomarkers have expression levels in the cells that are dependent on the activity of the EGFR signal transduction pathway and that are also highly correlated with EGFR modulator sensitivity exhibited by the cells. Biomarkers serve as useful molecular tools for predicting a response to EGFR modulators, preferably biological molecules, small molecules, and the like that affect EGFR kinase activity via direct or indirect inhibition or antagonism of EGFR kinase function or activity.

EGFR MODULATORS

As used herein, the term "EGFR modulator" is intended to mean a compound or drug that is a biological molecule or a small molecule that directly or indirectly modulates EGFR activity or the EGFR signal transduction pathway. Thus, compounds or drugs as used herein is intended to include both small molecules and biological molecules. Direct or indirect modulation includes activation or inhibition of EGFR activity or the EGFR signal transduction pathway. In one aspect, inhibition refers to inhibition of the binding of EGFR to an EGFR ligand such as, for example, EGF. In another aspect, inhibition refers to inhibition of the kinase activity of EGFR.

EGFR modulators include, for example, EGFR specific ligands, small molecule EGFR inhibitors, and EGFR monoclonal antibodies. In one aspect, the EGFR modulator inhibits EGFR activity and/or inhibits the EGFR signal transduction pathway. In another aspect, the EGFR modulator is an EGFR monoclonal antibody that inhibits EGFR activity and/or inhibits the EGFR signal transduction pathway.

EGFR modulators include biological molecules or small molecules. Biological molecules include all lipids and polymers of monosaccharides, amino acids, and nucleotides having a molecular weight greater than 450. Thus, biological molecules include, for example, oligosaccharides and polysaccharides; oligopeptides, polypeptides, peptides, and proteins; and oligonucleotides and polynucleotides. Oligonucleotides and polynucleotides include, for example, DNA and RNA.

Biological molecules further include derivatives of any of the molecules described above. For example, derivatives of biological molecules include lipid and glycosylation derivatives of oligopeptides, polypeptides, peptides, and proteins.

Derivatives of biological molecules further include lipid derivatives of oligosaccharides and polysaccharides, e.g., lipopolysaccharides. Most typically,

biological molecules are antibodies, or functional equivalents of antibodies. Functional equivalents of antibodies have binding characteristics comparable to those of antibodies, and inhibit the growth of cells that express EGFR. Such functional equivalents include, for example, chimerized, humanized, and single chain antibodies as well as fragments thereof.

Functional equivalents of antibodies also include polypeptides with amino acid sequences substantially the same as the amino acid sequence of the variable or hypervariable regions of the antibodies. An amino acid sequence that is substantially the same as another sequence, but that differs from the other sequence by means of one or more substitutions, additions, and/or deletions, is considered to be an equivalent sequence. Preferably, less than 50%, more preferably less than 25%, and still more preferably less than 10%, of the number of amino acid residues in a sequence are substituted for, added to, or deleted from the protein.

The functional equivalent of an antibody is preferably a chimerized or humanized antibody. A chimerized antibody comprises the variable region of a non-human antibody and the constant region of a human antibody. A humanized antibody comprises the hypervariable region (CDRs) of a non-human antibody. The variable region other than the hypervariable region, e.g., the framework variable region, and the constant region of a humanized antibody are those of a human antibody.

Suitable variable and hypervariable regions of non-human antibodies may be derived from antibodies produced by any non-human mammal in which monoclonal antibodies are made. Suitable examples of mammals other than humans include, for example, rabbits, rats, mice, horses, goats, or primates.

Functional equivalents further include fragments of antibodies that have binding characteristics that are the same as, or are comparable to, those of the whole antibody. Suitable fragments of the antibody include any fragment that comprises a sufficient portion of the hypervariable (i.e., complementarity determining) region to bind specifically, and with sufficient affinity, to EGFR tyrosine kinase to inhibit growth of cells that express such receptors.

Such fragments may, for example, contain one or both Fab fragments or the $F(ab')_2$ fragment. Preferably, the antibody fragments contain all six complementarity

determining regions of the whole antibody, although functional fragments containing fewer than all of such regions, such as three, four, or five CDRs, are also included.

In one aspect, the fragments are single chain antibodies, or Fv fragments. Single chain antibodies are polypeptides that comprise at least the variable region of the heavy chain of the antibody linked to the variable region of the light chain, with or without an interconnecting linker. Thus, Fv fragment comprises the entire antibody combining site. These chains may be produced in bacteria or in eukaryotic cells.

The antibodies and functional equivalents may be members of any class of immunoglobulins, such as IgG, IgM, IgA, IgD, or IgE, and the subclasses thereof. In one aspect, the antibodies are members of the IgG1 subclass. The functional equivalents may also be equivalents of combinations of any of the above classes and subclasses.

In one aspect, EGFR antibodies can be selected from chimerized, humanized, fully human, and single chain antibodies derived from the murine antibody 225 described in U.S. Patent No. 4,943,533 to Mendelsohn et al., including, for example, cetuximab.

In another aspect, the EGFR antibody can be selected from the antibodies described in U.S. Patent No. 6,235,883 to Jakobovits et al., U.S. Patent No. 5,558,864 to Bendi et al., and U.S. Patent No. 5,891,996 to Mateo de Acosta del Rio et al.

In addition to the biological molecules discussed above, the EGFR modulators useful in the invention may also be small molecules. Any molecule that is not a biological molecule is considered herein to be a small molecule. Some examples of small molecules include organic compounds, organometallic compounds, salts of organic and organometallic compounds, saccharides, amino acids, and nucleotides. Small molecules further include molecules that would otherwise be considered biological molecules, except their molecular weight is not greater than 450. Thus, small molecules may be lipids, oligosaccharides, oligopeptides, and oligonucleotides and their derivatives, having a molecular weight of 450 or less.

It is emphasized that small molecules can have any molecular weight. They are merely called small molecules because they typically have molecular weights less than 450. Small molecules include compounds that are found in nature as well as synthetic compounds. In one embodiment, the EGFR modulator is a small molecule

that inhibits the growth of tumor cells that express EGFR. In another embodiment, the EGFR modulator is a small molecule that inhibits the growth of refractory tumor cells that express EGFR. In yet another embodiment, the EGFR modulator is erlotinib HCl or gefitinib.

Numerous small molecules have been described as being useful to inhibit EGFR. For example, U.S. Patent No. 5,656,655 to Spada et al. discloses styryl substituted heteroaryl compounds that inhibit EGFR. The heteroaryl group is a monocyclic ring with one or two heteroatoms, or a bicyclic ring with 1 to about 4 heteroatoms, the compound being optionally substituted or polysubstituted.

U.S. Patent No. 5,646,153 to Spada et al. discloses bis mono and/or bicyclic aryl heteroaryl, carbocyclic, and heterocarbocyclic compounds that inhibit EGFR.

U.S. Patent No. 5,679,683 to Bridges et al. discloses tricyclic pyrimidine compounds that inhibit the EGFR. The compounds are fused heterocyclic pyrimidine derivatives described at column 3, line 35 to column 5, line 6.

U.S. Patent No. 5,616,582 to Barker discloses quinazoline derivatives that have receptor tyrosine kinase inhibitory activity.

Fry et al., Science 265, 1093-1095 (1994) in Figure 1 discloses a compound having a structure that inhibits EGFR.

Osherov et al. disclose tyrphostins that inhibit EGFR/HER1 and HER 2, particularly those in Tables I, II, III, and IV.

U.S. Patent No. 5,196,446 to Levitzki et al. discloses heteroarylethenediyl or heteroarylethendeiylaryl compounds that inhibit EGFR, particularly from column 2, line 42 to column 3, line 40.

Panek et al., Journal of Pharmacology and Experimental Therapeutics 283, 1433-1444 (1997) discloses a compound identified as PD166285 that inhibits the EGFR, PDGFR, and FGFR families of receptors. PD166285 is identified as 6-(2,6-dichlorophenyl)-2-(4-(2-diethylaminoethyoxy)phenylamino)-8-methyl-8H-pyrido(2,3-d)pyrimidin-7-one having the structure shown in Figure 1 on page 1436.

BIOMARKERS AND BIOMARKER SETS

The invention includes individdual biomarkers and biomarker sets having both diagnostic and prognostic value in disease areas in which signaling through EGFR or

the EGFR pathway is of importance, e.g., in cancers or tumors, in immunological disorders, conditions or dysfunction, or in disease states in which cell signaling and/or cellular proliferation controls are abnormal or aberrant. The biomarker sets comprise a plurality of biomarkers such as, for example, a plurality of the biomarkers provided in Table 1, that highly correlate with resistance or sensitivity to one or more EGFR modulators.

The biomarker sets of the invention enable one to predict or reasonably foretell the likely effect of one or more EGFR modulators in different biological systems or for cellular responses. The biomarker sets can be used in *in vitro* assays of EGFR modulator response by test cells to predict *in vivo* outcome. In accordance with the invention, the various biomarker sets described herein, or the combination of these biomarker sets with other biomarkers or markers, can be used, for example, to predict how patients with cancer might respond to therapeutic intervention with one or more EGFR modulators.

A biomarker set of cellular gene expression patterns correlating with sensitivity or resistance of cells following exposure of the cells to one or more EGFR modulators provides a useful tool for screening one or tumor samples before treatment with the EGFR modulator. The screening allows a prediction of cells of a tumor sample exposed to one or more EGFR modulators, based on the expression results of the biomarker set, as to whether or not the tumor, and hence a patient harboring the tumor, will or will not respond to treatment with the EGFR modulator.

The biomarker or biomarker set can also be used as described herein for monitoring the progress of disease treatment or therapy in those patients undergoing treatment for a disease involving an EGFR modulator.

The biomarkers also serve as targets for the development of therapies for disease treatment. Such targets may be particularly applicable to treatment of colon disease, such as colon cancers or tumors. Indeed, because these biomarkers are differentially expressed in sensitive and resistant cells, their expression patterns are correlated with relative intrinsic sensitivity of cells to treatment with EGFR modulators. Accordingly, the biomarkers highly expressed in resistant cells may serve as targets for the development of new therapies for the tumors which are resistant to EGFR modulators, particularly EGFR inhibitors.

MICROARRAYS

The invention also includes specialized microarrays, e.g., oligonucleotide microarrays or cDNA microarrays, comprising one or more biomarkers, showing expression profiles that correlate with either sensitivity or resistance to one or more EGFR modulators. Such microarrays can be employed in *in vitro* assays for assessing the expression level of the biomarkers in the test cells from tumor biopsies, and determining whether these test cells are likely to be resistant or sensitive to EGFR modulators. For example, a specialized microarray can be prepared using all the biomarkers, or subsets thereof, as described herein and shown in Table 1. Cells from a tissue or organ biopsy can be isolated and exposed to one or more of the EGFR modulators. Following application of nucleic acids isolated from both untreated and treated cells to one or more of the specialized microarrays, the pattern of gene expression of the tested cells can be determined and compared with that of the biomarker pattern from the control panel of cells used to create the biomarker set on the microarray. Based upon the gene expression pattern results from the cells that underwent testing, it can be determined if the cells show a resistant or a sensitive profile of gene expression. Whether or not the tested cells from a tissue or organ biopsy will respond to one or more of the EGFR modulators and the course of treatment or therapy can then be determined or evaluated based on the information gleaned from the results of the specialized microarray analysis.

ANTIBODIES

The invention also includes antibodies, including polyclonal or monoclonal, directed against one or more of the polypeptide biomarkers. Such antibodies can be used in a variety of ways, for example, to purify, detect, and target the biomarkers of the invention, including both *in vitro* and *in vivo* diagnostic, detection, screening, and/or therapeutic methods.

KITS

The invention also includes kits for determining or predicting whether a patient would be susceptible or resistant to a treatment that comprises one or more

EGFR modulators. The patient may have a cancer or tumor such as, for example, a colon cancer or tumor. Such kits would be useful in a clinical setting for use in testing a patient's biopsied tumor or cancer samples, for example, to determine or predict if the patient's tumor or cancer will be resistant or sensitive to a given treatment or therapy with an EGFR modulator. The kit comprises a suitable container that comprises: one or more microarrays, e.g., oligonucleotide microarrays or cDNA microarrays, that comprise those biomarkers that correlate with resistance and sensitivity to EGFR modulators, particularly EGFR inhibitors; one or more EGFR modulators for use in testing cells from patient tissue specimens or patient samples; and instructions for use. In addition, kits contemplated by the invention can further include, for example, reagents or materials for monitoring the expression of biomarkers of the invention at the level of mRNA or protein, using other techniques and systems practiced in the art such as, for example, RT-PCR assays, which employ primers designed on the basis of one or more of the biomarkers described herein, immunoassays, such as enzyme linked immunosorbent assays (ELISAs), immunoblotting, e.g., Western blots, or *in situ* hybridization, and the like, as further described herein.

APPLICATION OF BIOMARKERS AND BIOMARKER SETS

The biomarkers and biomarker sets may be used in different applications. Biomarker sets can be built from any combination of biomarkers listed in Table 1 to make predictions about the likely effect of any EGFR modulator in different biological systems. The various biomarkers and biomarkers sets described herein can be used, for example, as diagnostic or prognostic indicators in disease management, to predict how patients with cancer might respond to therapeutic intervention with compounds that modulate the EGFR, and to predict how patients might respond to therapeutic intervention that modulates signaling through the entire EGFR regulatory pathway.

While the data described herein were generated in cell lines that are routinely used to screen and identify compounds that have potential utility for cancer therapy, the biomarkers have both diagnostic and prognostic value in other diseases areas in which signaling through EGFR or the EGFR pathway is of importance, e.g., in

immunology, or in cancers or tumors in which cell signaling and/or proliferation controls have gone awry.

In accordance with the invention, cells from a patient tissue sample, e.g., a tumor or cancer biopsy, can be assayed to determine the expression pattern of one or more biomarkers prior to treatment with one or more EGFR modulators. Success or failure of a treatment can be determined based on the biomarker expression pattern of the cells from the test tissue (test cells), e.g., tumor or cancer biopsy, as being relatively similar or different from the expression pattern of a control set of the one or more biomarkers. Thus, if the test cells show a biomarker expression profile which corresponds to that of the biomarkers in the control panel of cells which are sensitive to the EGFR modulator, it is highly likely or predicted that the individual's cancer or tumor will respond favorably to treatment with the EGFR modulator. By contrast, if the test cells show a biomarker expression pattern corresponding to that of the biomarkers of the control panel of cells which are resistant to the EGFR modulator, it is highly likely or predicted that the individual's cancer or tumor will not respond to treatment with the EGFR modulator.

The invention also provides a method of monitoring the treatment of a patient having a disease treatable by one or more EGFR modulators. The isolated test cells from the patient's tissue sample, e.g., a tumor biopsy or tumor sample, can be assayed to determine the expression pattern of one or more biomarkers before and after exposure to an EGFR modulator wherein, preferably, the EGFR modulator is an EGFR inhibitor. The resulting biomarker expression profile of the test cells before and after treatment is compared with that of one or more biomarkers as described and shown herein to be highly expressed in the control panel of cells that are either resistant or sensitive to an EGFR modulator. Thus, if a patient's response is sensitive to treatment by an EGFR modulator, based on correlation of the expression profile of the one or biomarkers, the patient's treatment prognosis can be qualified as favorable and treatment can continue. Also, if, after treatment with an EGFR modulator, the test cells don't show a change in the biomarker expression profile corresponding to the control panel of cells that are sensitive to the EGFR modulator, it can serve as an indicator that the current treatment should be modified, changed, or even discontinued. This monitoring process can indicate success or failure of a patient's

treatment with an EGFR modulator and such monitoring processes can be repeated as necessary or desired.

The biomarkers of the invention can be used to predict an outcome prior to having any knowledge about a biological system. Essentially, a biomarker can be considered to be a statistical tool. Biomarkers are useful primarily in predicting the phenotype that is used to classify the biological system. In an embodiment of the invention, the goal of the prediction is to classify cancer cells as having an active or inactive EGFR pathway. Cancer cells with an inactive EGFR pathway can be considered resistant to treatment with an EGFR modulator. An inactive EGFR pathway is defined herein as a non-significant expression of the EGFR or by a classification as "resistant" or "sensitive" based on the IC_{50} value of each colon cell line to EGFR inhibitor compound as exemplified herein.

However, although the complete function of all of the biomarkers are not currently known, some of the biomarkers are likely to be directly or indirectly involved in the EGFR signaling pathway. In addition, some of the biomarkers may function in the metabolic or other resistance pathways specific to the EGFR modulators tested. Notwithstanding, knowledge about the function of the biomarkers is not a requisite for determining the accuracy of a biomarker according to the practice of the invention.

EXAMPLES:

EXAMPLE 1 - Identification of Biomarkers

The biomarkers of Table 1 were identified as follows.

Colon Tumors and Patients:

Forty colon tumors collected from the University of London between 1998 and 2002. The median age of the patients was 70 years (range: 26-91 years). The patients were diagnosed as follows: 6 patients were designated as Duke's A, 14 as Duke's B, and 20 as Duke's C. None of the patients were treated pre-operatively, and 13 were treated post-operatively.

Determination of Relative Drug Sensitivity in Colon Cancer Cell Lines:

The cell line filtering process used is illustrated in FIG. 2.

The colon cancer cell lines were grown using standard cell culture conditions: RPMI 1640 supplemented to contain 10% fetal bovine serum, 100 IU/ml penicillin, 100 mg/ml streptomycin, 2 mM L-glutamine and 10 mM Hepes (all from GibcoBRL, Rockville, MD). Twenty-one colon cancer cell lines were examined for their relative sensitivity to a pair of small molecule EGFR inhibitors, erlotinib HCl and gefitinib. Cytotoxicity was assessed in cells by MTS (3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulphenyl)-2H-tetrazolium, inner salt)assay (T.L. Riss et al., 1992, Mol. Biol. Cell, 3 (Suppl.):184a). To carry out the assays, the colon cancer cells were plated at 4,000 cells/well in 96 well microtiter plates and 24 hours later serial diluted drugs were added. The concentration range for the EGFR inhibitor compounds used in the cytotoxicity assays was 50 ug/ml to 0.0016 ug/ml (roughly 100 uM to 0.0032 uM). The cells were incubated at 37 °C for 72 hours at which time the tetrazolium dye MTS (333 ug/ml final concentration in combination with the electron coupling agent phenazine methosulfate) was added. A dehydrogenase enzyme in live cells reduces the MTS to a form that absorbs light at 492 nm that can be quantified spectrophotometrically. The greater the absorbency, the greater the number of live cells. The results, provided below in Table 2 and FIG. 3, are expressed as an IC50, which is the drug concentration required to inhibit cell proliferation to 50% of that of untreated cells.

Table 2 - Colon Cell Lines

Cell Line	**ATCC No.**	**Avg. IC50**
CaCo2	HTB-37	5.4
Colo 201	CCL-224	10+
Colo 205	CCL-222	10+
CS-1		10+
Difi		1
DLD-1		20
Geo		3.6
HCT116	CCL-247	67+
HCT116S542		53

HCT-8	CCL-244	10+
HT-29	HTB-38	10+
Lovo	CCL-229LS174T	3
LS1034		68+
RKORM13		29
SW1116		20
SW403		6.2
SW480	CCL-228	10+
SW837	CCL-235	7
SW948		73+
T84	CCL-248	10+
WiDr		67+

Resistance/sensitivity classification:

Two separate analyses were performed using different cut-offs to define EGFR-inhibitor resistance. For the first (designated "6-15"), the 6 cell lines with an IC50 at or below 7 uM were defined as sensitive and the remaining 15 cell lines were defined as resistant. For the second (designated "3-18"), the 3 cell lines with an IC50 below 4 uM were defined as sensitive and the remaining 18 cell lines were defined as resistant.

Gene Expression Profiling:

RNA was isolated from 50-70% confluent cell lines or colon cancer tumor tissue using the Rneasy kits from Qiagen (Valencia, CA). The quality of RNA was checked by measuring the 28S:18: ribosomal RNA ratio using and Agilent 2100 bioanalyzer (Agilent Technologies, Rockville, MD). Concentration of total RNA was determined spectrophotemetrically. 10 ug of total RNA was used to prepare biotyinylated probes according to the Affymetrix Genechip Expression Analysis Technical Manual. Targets were hybridized to human HG-U133A gene chips according to the manufacturers instructions. Data were preprocessed using the MAS 5.0 software (Affymetrix, Santa Clara, CA). The trimmed mean intensity for each chip was scaled to 1,500 to account for minor differences in global chip intensity so

that the overall expression level for each sample is comparable.

Data Analysis

All 22,215 probes (gene sequences) present on the U133A chip were considered as potential predictive biomarkers. To restrict the analysis to gene sequences expressed at a moderate level in colon tumor(s), gene sequences without at least one expression value of 2X the mean value for the array (3000 expression units) were removed leaving 6988 gene sequences. Next, to identify genes with variable expression in colon tumors (and therefore more likely to be able to correlate with variability in response to treatment), gene sequences with a VARP value (using log10-transformed data) < 0.1 were removed leaving 745 gene sequences. Next, the same expression and variance filters were applied to the remaining 745 gene sequences using the colon cell line data, reducing to 332 gene sequences for analysis (FIG. 1).

The 332 gene sequences were then subjected to a two-sided T-test using the Resistance/sensitivity classifications of the cell lines described above (FIG. 3). A total of 12 gene sequences had a p-value of <0.05 for both analyses (T-test Results I, FIG. 4). For the "6-15" analysis, 19 gene sequences were found to have a p-value <0.05 (T-Test Results II, FIG. 5). For the "3-18" analysis, 29 gene sequences were found to have a p-value <0.05 (T-test Results III, FIG. 6). Table 1 provides the biomarkers identified using the two-sided T-test.

EXAMPLE 2 - Untreated Xenograph Profiles

In Example 1, biomarkers were identified using sensitivity resistance profiles of cell lines to gefitinib and erlotinib HCl. The present example provided efficacy data for cetuximab (C225) in the colon cancer xenograft models Geo (sensitive to C225) and HT29 (resistant to C225).

In Vivo Antitumor Testing

Tumors were propagated in nude mice as subcutaneous (sc) transplants using tumor fragments obtained from donor mice. Tumor passage occurred approximately every two to four weeks. Tumors were then allowed to grow to the pre-determined

size window (usually between 100-200 mg, tumors outside the range were excluded) and animals were evenly distributed to various treatment and control groups. Animals were treated with C225 (1 mg/mouse q3d X 10, 14, ip). Treated animals were checked daily for treatment related toxicity/mortality. Each group of animals was weighed before the initiation of treatment (Wt1) and then again following the last treatment dose (Wt2). The difference in body weight (Wt2-Wt1) provided a measure of treatment-related toxicity. Tumor response was determined by measurement of tumors with a caliper twice a week, until the tumors reached a predetermined target size of 1 gm or became necrotic. Tumor weights (mg) were estimated from the formula:

$$\text{Tumor weight} = (\text{length} \times \text{width}^2)/2$$

Antitumor activity was determined in terms of primary tumor growth inhibition. This was determined in two ways: (i) calculating the relative median tumor weight (MTW) of treated (T) and control (C) mice at various time points (effects were expressed as %T/C); and (ii) calculating the tumor growth delay (T-C value), defined as the difference in time (days) required for the treated tumors (T) to reach a predetermined target size compared to those of the control group (C). Statistical evaluations of data were performed using Gehan's generalized Wilcoxon test for comparisons of time to reach tumor target size (Gehan 1965). Statistical significance was declared at $p < 0.05$. Antitumor activity was defined as a continuous MTW %T/C $\leq$ 50% for at least 1 tumor volume doubling time (TVDT) any time after the start of treatment, where TVDT (tumor volume doubling time) = median time (days) for control tumors to reach target size – median time (days) for control tumors to reach half the target size. In addition, treatment groups had to be accompanied by a statistically significant tumor growth delay (T-C value) ($p < 0.05$) to be termed active.

Treated animals were checked daily for treatment related toxicity/mortality. When death occurred, the day of death was recorded. Treated mice dying prior to having their tumors reach target size were considered to have died from drug toxicity. No control mice died bearing tumors less than target size. Treatment groups with more than one death caused by drug toxicity were considered to have had excessively toxic treatments and their data were not included in the evaluation of the compound's antitumor efficacy.

Table 3 provides the resulting untreated xenograph profiles.

Table 3 - Untreated Xenograph Profiles

Biomarker	**Probe**	**Differential expression in Geo (sensitive) and HT-29 (resistant) untreated xenografts**	**Absence and Presence of HT-29 and Geo**
transforming growth factor, beta-induced, 68kD	201506_at	Higher 373X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
carcinoembryonic antigen-related cell adhesion molecule 5	201884_at	Higher 85X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
nerve growth factor receptor (TNFRSF16) associated protein 1	217963_s_at	Higher 50X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
carcinoembryonic antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen)	211657_at	Higher 23X in Geo than HT-29(Absent)	HT-29 Absent Geo Present
annexin A1	201012_at	Higher 16X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
tumor protein p53 (Li-Fraumeni syndrome)	211300_s_at	Higher 11X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
DVS27-related protein	209821_at	Higher 9X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
cystic fibrosis transmembrane conductance regulator, ATP-binding cassette (sub-family C, member 7)	205043_at	Higher 7X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1	211429_s_at	Higher 7X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
bone morphogenetic protein 7 (osteogenic protein 1)	209591_s_at	Higher 4X in Geo than HT-29 (Absent)	HT-29 Absent Geo Present
interferon-stimulated protein, 15 kDa	205483_s_at	Higher 3X in Geo than HT-29(Absent)	HT-29 Absent Geo Present
S100 calcium-binding protein P	204351_at	Higher 11X in Geo than HT-29	HT-29 Present Geo Present
carcinoembryonic	203757_s_at	Higher 8X in Geo than HT-	HT-29 Present

antigen-related cell adhesion molecule 6 (non-specific cross reacting antigen)		29	Geo Present
putative integral membrane transporter	208029_s_at	Higher 7X in Geo than HT-29	HT-29 Present Geo Present
cadherin 17, LI cadherin (liver-intestine)	209847_at	Higher 4X in Geo than HT-29	HT-29 Present Geo Present
FXYD domain-containing ion transport regulator 3	202489_s_at	Higher 3X in Geo than HT-29	HT-29 Present Geo Present
insulin-like growth factor binding protein 2 (36kD)	202718_at	Higher 3X in Geo than HT-29	HT-29 Present Geo Present
eukaryotic translation initiation factor 5A	201123_s_at	Higher 3X in Geo than HT-29	HT-29 Present Geo Present
3-hydroxy-3-methylglutaryl-Coenzyme A synthase 2 (mitochondrial)	204607_at	Higher 2X in Geo than HT-29	HT-29 Present Geo Present
serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1	202833_s_at	Higher 21X in HT-29 than Geo	HT-29 Present Geo Present
transmembrane protease, serine 2	211689_s_at	Higher 7X in HT-29 than Geo	HT-29 Present Geo Present
protease inhibitor 3, skin-derived (SKALP)	41469_at	Higher 6X in HT-29 than Geo	HT-29 Present Geo Present
serine (or cysteine) proteinase inhibitor, clade B (ovalbumin), member 5	204855_at	Higher 4X in HT-29 than Geo	HT-29 Present Geo Present
fibroblast growth factor receptor 3 (achondroplasia, thanatophoric dwarfism)	204379_s_at	Higher 3X in HT-29 than Geo	HT-29 Present Geo Present
mucin 3B	214898_x_at	Higher 3X in HT-29 than Geo	HT-29 Present Geo Present
fucosyltransferase 3 (galactoside 3(4)-L-fucosyltransferase, Lewis blood group included)	214088_s_at	Higher 3X in HT-29 than Geo	HT-29 Present Geo Present
phospholipase A2, group IIA (platelets,	203649_s_at	Higher 2X in HT-29 than Geo	HT-29 Present Geo Present

synovial fluid)			
A kinase (PRKA) anchor protein (gravin) 12	210517_s_at	Higher 339X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
serine (or cysteine) proteinase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1	202628_s_at	Higher 280X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
ESTs, Highly similar to A39092 glucuronosyltransferase [H.sapiens]	215125_s_at	Higher 75X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
Purkinje cell protein 4	205549_at	Higher 38X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
lectin, galactoside-binding, soluble, 1 (galectin 1)	201105_at	Higher 33X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
old astrocyte specifically induced substance	213059_at	Higher 29X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
UDP glycosyltransferase 1 family, polypeptide A3	208596_s_at	Higher 23X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
hypothetical protein PP1665	213343_s_at	Higher 21X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
membrane protein, palmitoylated 1 (55kD)	202974_at	Higher 9X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
caudal type homeo box transcription factor 2	206387_at	Higher 8X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
polymeric immunoglobulin receptor	204213_at	Higher 7X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
mucin 5, subtypes A and C, tracheobronchial/gastric	214385_s_at	Higher 6X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
metallothionein 1G	204745_x_at	Higher 2X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
inhibitor of DNA binding 3, dominant negative helix-loop-helix protein	207826_s_at	Higher 2X in HT-29 than Geo (Absent)	HT-29 Present Geo Absent
lymphocyte antigen 75	205668_at	not differentially expressed	HT-29 Present

			Geo Absent
secretory leukocyte protease inhibitor (antileukoproteinase)	203021_at	not differentially expressed	HT-29 Present Geo Absent
dopa decarboxylase (aromatic L-amino acid decarboxylase)	205311_at	not differentially expressed	HT-29 Present Geo Absent
G protein-coupled receptor 49	213880_at	not differentially expressed	HT-29 Present Geo Absent
interferon, alpha-inducible protein 27	202411_at	not differentially expressed	HT-29 Present Geo Absent
Homo sapiens CD44 isoform RC (CD44) mRNA, complete cds	210916_s_at	not differentially expressed	HT-29 Present Geo Absent
mucin 5, subtypes A and C, tracheobronchial/gastric	214303_x_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
UDP glycosyltransferase 1 family, polypeptide A1	207126_x_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
metallothionein 1F (functional)	217165_x_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
GRO3 oncogene	207850_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
protease inhibitor 3, skin-derived (SKALP)	203691_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
annexin A10	210143_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
protein tyrosine phosphatase, receptor type, N polypeptide 2	203029_s_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
solute carrier family 7 (cationic amino acid transporter, y+ system), member 8	202752_x_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
collagen, type XVIII, alpha 1	209081_s_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
collagen, type IX, alpha 3	204724_s_at	absent in HT-29 and Geo	HT-29 Absent Geo Absent
alpha-2-HS-glycoprotein	210929_s_at	?	HT-29 Absent Geo Absent
metallothionein 1X	208581_x_at	?	HT-29 Absent Geo Absent
tumor necrosis factor receptor superfamily,	206467_x_at	?	HT-29 Absent Geo Absent

member 6b, decoy			

EXAMPLE 3 - PRODUCTION OF ANTIBODIES AGAINST THE BIOMARKERS

Antibodies against the biomarkers can be prepared by a variety of methods. For example, cells expressing an biomarker polypeptide can be administered to an animal to induce the production of sera containing polyclonal antibodies directed to the expressed polypeptides. In one aspect, the biomarker protein is prepared and isolated or otherwise purified to render it substantially free of natural contaminants, using techniques commonly practiced in the art. Such a preparation is then introduced into an animal in order to produce polyclonal antisera of greater specific activity for the expressed and isolated polypeptide.

In one aspect, the antibodies of the invention are monoclonal antibodies (or protein binding fragments thereof). Cells expressing the biomarker polypeptide can be cultured in any suitable tissue culture medium, however, it is preferable to culture cells in Earle's modified Eagle's medium supplemented to contain 10% fetal bovine serum (inactivated at about 56 °C), and supplemented to contain about 10 g/l nonessential amino acids, about 1,00 U/ml penicillin, and about 100 µg/ml streptomycin.

The splenocytes of immunized (and boosted) mice can be extracted and fused with a suitable myeloma cell line. Any suitable myeloma cell line can be employed in accordance with the invention, however, it is preferable to employ the parent myeloma cell line (SP2/0), available from the ATCC. After fusion, the resulting hybridoma cells are selectively maintained in HAT medium, and then cloned by limiting dilution as described by Wands et al. (1981, *Gastroenterology*, 80:225-232). The hybridoma cells obtained through such a selection are then assayed to identify those cell clones that secrete antibodies capable of binding to the polypeptide immunogen, or a portion thereof.

Alternatively, additional antibodies capable of binding to the biomarker polypeptide can be produced in a two-step procedure using anti-idiotypic antibodies. Such a method makes use of the fact that antibodies are themselves antigens and, therefore, it is possible to obtain an antibody that binds to a second antibody. In accordance with this method, protein specific antibodies can be used to immunize an

animal, preferably a mouse. The splenocytes of such an immunized animal are then used to produce hybridoma cells, and the hybridoma cells are screened to identify clones that produce an antibody whose ability to bind to the protein-specific antibody can be blocked by the polypeptide. Such antibodies comprise anti-idiotypic antibodies to the protein-specific antibody and can be used to immunize an animal to induce the formation of further protein-specific antibodies.

EXAMPLE 4 - IMMUNOFLUORESCENCE ASSAYS

The following immunofluorescence protocol may be used, for example, to verify EGFR biomarker protein expression on cells or, for example, to check for the presence of one or more antibodies that bind EGFR biomarkers expressed on the surface of cells. Briefly, Lab-Tek II chamber slides are coated overnight at 4 °C with 10 micrograms/milliliter (μg/ml) of bovine collagen Type II in DPBS containing calcium and magnesium (DPBS++). The slides are then washed twice with cold DPBS++ and seeded with 8000 CHO-CCR5 or CHO pC4 transfected cells in a total volume of 125 μl and incubated at 37 °C in the presence of 95% oxygen / 5% carbon dioxide.

The culture medium is gently removed by aspiration and the adherent cells are washed twice with DPBS++ at ambient temperature. The slides are blocked with DPBS++ containing 0.2% BSA (blocker) at 0-4 °C for one hour. The blocking solution is gently removed by aspiration, and 125 μl of antibody containing solution (an antibody containing solution may be, for example, a hybridoma culture supernatant which is usually used undiluted, or serum/plasma which is usually diluted, e.g., a dilution of about 1/100 dilution). The slides are incubated for 1 hour at 0-4 °C. Antibody solutions are then gently removed by aspiration and the cells are washed five times with 400 μl of ice cold blocking solution. Next, 125 μl of 1 μg/ml rhodamine labeled secondary antibody (e.g., anti-human IgG) in blocker solution is added to the cells. Again, cells are incubated for 1 hour at 0-4 °C.

The secondary antibody solution is then gently removed by aspiration and the cells are washed three times with 400 μl of ice cold blocking solution, and five times with cold DPBS++. The cells are then fixed with 125 μl of 3.7% formaldehyde in DPBS++ for 15 minutes at ambient temperature. Thereafter, the cells are washed five

times with 400 µl of DPBS++ at ambient temperature. Finally, the cells are mounted in 50% aqueous glycerol and viewed in a fluorescence microscope using rhodamine filters.

CLAIMS:

What is claimed is:

1. A method for identifying a mammal that will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises:

(a) measuring in the mammal the level of at least one biomarker selected from the biomarkers of Table 1;

(b) exposing the mammal to the EGFR modulator;

(c) following the exposing of step (b), measuring in the mammal the level of the at least one biomarker,

wherein a difference in the level of the at least one biomarker measured in step (c) compared to the level of the at least one biomarker measured in step (a) indicates that the mammal will respond therapeutically to said method of treating cancer.

2. The method of claim 1 wherein the method is an in vitro method, and wherein the at least one biomarker is measured in at least one mammalian biological sample from the mammal.

3. A method for identifying a mammal that will respond therapeutically to a method of treating cancer comprising administering an EGFR modulator, wherein the method comprises:

(a) exposing the mammal to the EGFR modulator;

(b) following the exposing of step (a), measuring in the mammal the level of the at least one biomarker selected from the biomarkers of Table 1,

wherein a difference in the level of the at least one biomarker measured in step (b), compared to the level of the biomarker in a mammal that has not been exposed to said EGFR modulator, indicates that the mammal will respond therapeutically to said method of treating cancer.

FIG. 1 - Gene Filtering Process

Step 1: log-transform transcription data

Step 2: remove probesets with colon tumor Max intensity < 3.477

Step 3: remove probesets with colon tumor VARP < 0.1

Step 4: remove probesets with colon cell line Max intensity < 3.477

Step 5: remove probesets with colon cell line VARP < 0.1

Step 6: perform two-sided T-test on colon cell line transcription data

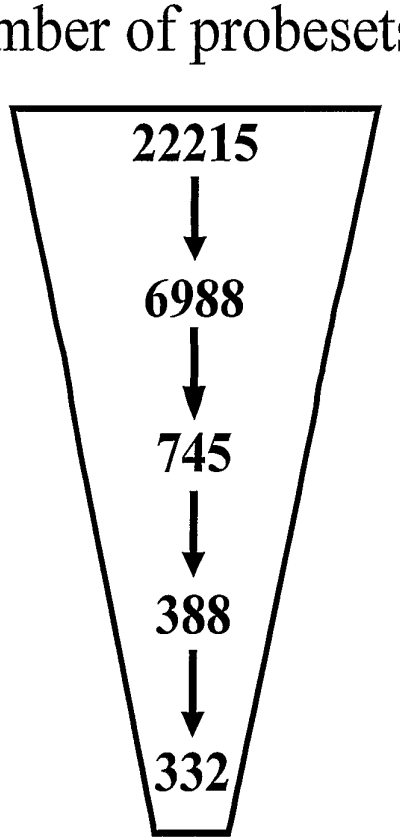


FIG. 2 - Cell Line Filtering Process

Step 1: remove EGFR-negative cell lines

Step 2: remove cell lines with variable response to EGFR inhibitors

Step 3: calculate average IC50 value for erlotinib HCl and gefitinib

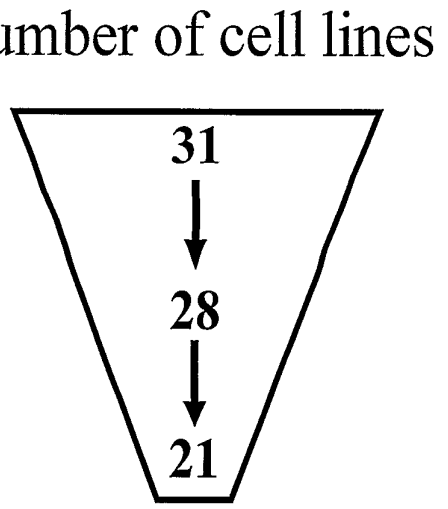


FIG. 3 - Cell Line IC50 data

Sensitive

Cell Line	Avg. IC50 (erlotinib HCl/gefitinib)
Difi	1.0 ()
Lovo	3.0 (2.4/3.6)
Geo	3.6 (3.3/4.2)
CaCo2	5.4 (5.5/5.2)
SW403	6.2 (5.7/6.8)
SW837	7.0 (7.2/6.8)

Resistant

Cell Line	Avg IC50 (erlotinib HCl/gefitinib)
Colo 201	10+ (10+/10+)
Colo 205	10+ (10+/10+)
CX-1	10+ (10+/10+)
HCT-8	10+ (10+/10+)
HT-29	10+ (10+/10+)
SW480	10+ (10+/10+)
T84	10+ (10+/10+)
DLD-1	20 (20/20)
SW1116	20 (23/17)
RKORM13	29 (42/16)
HCT116S542	53 (85/20)
HCT116	67+ (116+/18)
WiDr	67+ (116+/18)
LS1034	68+ (116+/19)
SW948	73+ (116+/29)

Compare

- IC50 < 7μM vs. > 10μM (6 sensitive vs. 15 resistant)
- IC50 < 4μM vs. > 5μM (3 sensitive vs. 18 resistant*)

(*18 resistant is bottom 3 sensitive (CaCo2, SW403, SW837) and 15 resistant)

FIG. 4 - T-test Results I

Gene	T-test 6-15	T-test 3-18
cadherin 17, LI cadherin (liver-intestine)	0.0004	0.0010
CEACAM6	0.0004	0.0008
CEACAM6	0.0015	0.0014
lectin, galactoside-binding, soluble, 1 (galectin 1)	0.0019	0.0017
transmembrane protease, serine 2	0.0090	0.0087
mucin 5, subtypes A and C, tracheobronchial/gastric	0.0166	0.0298
HMGCoA synthase 2 (mitochondrial)	0.0169	0.0005
interferon-stimulated protein, 15 kDa	0.0204	0.0493
dopa decarboxylase	0.0235	0.0035
SERPIN E1	0.0271	0.0313
FXYD domain-containing ion transport regulator 3	0.0271	0.0156
putative integral membrane transporter	0.0439	0.0216

12 Genes with $p<0.05$ for both comparisons

FIG. 5 - T-test Results II

Gene	T-test 6-15	T-test 3-18	
protease inhibitor 3, skin-derived (SKALP)	0.0011	0.1158	
caudal type homeo box transcription factor 2	0.0024	0.0573	
fibroblast grow th factor receptor 3	0.0118	0.0784	
hypothetical protein PP1665	0.0141	0.2068	
protease inhibitor 3, skin-derived (SKALP)	0.0170	0.2217	
A kinase (PRKA) anchor protein (gravin) 12	0.0217	0.0907	
lymphocyte antigen 75	0.0234	0.1534	
mucin 5, subtypes A and C, tracheobronchial/gastric	0.0250	0.0883	
metallothionein 1G	0.0337	0.3549	
tumor necrosis factor receptor superfamily, member 6b, decoy	0.0357	0.0931	
mucin 3B	0.0384	0.3571	
metallothionein 1X	0.0411	0.4250	
GRO3 oncogene	0.0413	0.0913	
transforming grow th factor, beta-induced, 68kD	0.0420	0.3868	
bone morphogenetic protein 7 (osteogenic protein 1)	0.0435	0.1995	
annexin A10	0.0437	0.1566	
metallothionein 1F (functional)	0.0468	0.2643	
annexin A1	0.0494	0.5338	
secretory leukocyte protease inhibitor	0.0496	0.2271	

19 Genes with $p<0.05$ for 6 Sensitive vs. 15 Resistant

FIG. 6 - T-test Results III

Gene	T-test 6-15	T-test 3-18
polymeric immunoglobulin receptor	0.0535	0.0026
CEACAM 5	0.0609	0.0088
PTP, receptor type, N polypeptide 2	0.0616	0.0106
CFTR, ATP-binding cassette (sub-family C, member 7)	0.0715	0.0027
DVS27-related protein	0.1179	0.0000
insulin-like growth factor binding protein 2 (36kD)	0.2513	0.0081
inhibitor of DNA binding 3	0.2622	0.0112
phospholipase A2, group IIA (platelets, synovial fluid)	0.3361	0.0277
Purkinje cell protein 4	0.4373	0.0000
G protein-coupled receptor 49	0.4415	0.0251
fucosyltransferase 3	0.4451	0.0261
interferon, alpha-inducible protein 27	0.4453	0.0103
SERPIN B5	0.4528	0.0184
Homo sapiens CD44 isoform RC	0.4653	0.0339
solute carrier family 7, member 8	0.4748	0.0309
membrane protein, palmitoylated 1 (55kD)	0.4756	0.0248
tumor protein p53 (Li-Fraumeni syndrome)	0.5178	0.0258
S100 calcium-binding protein P	0.5498	0.0423
SERPIN A1	0.5579	0.0200
eukaryotic translation initiation factor 5A	0.5974	0.0083
old astrocyte specifically induced substance	0.6224	0.0325
UDP glycosyltransferase 1 family, polypeptide A3	0.6251	0.0008
alpha-2-HS-glycoprotein	0.6449	0.0131
ESTs, Highly similar to A39092 glucuronosyltransferase	0.6587	0.0017
UDP glycosyltransferase 1 family, polypeptide A1	0.7178	0.0010
SERPIN A1	0.7266	0.0205
nerve growth factor receptor associated protein 1	0.8525	0.0033
collagen, type XVIII, alpha 1	0.9341	0.0020
collagen, type IX, alpha 3	0.9861	0.0007

29 Genes with $p<0.05$ for 3 Sensitive vs. 18 Resistant

SEQUENCE LISTING

<110> Clark, Edwin
Ford, Shirin
Yoganathan, Suganthy
Jackson, Donald

<120> BIOMARKERS AND METHODS FOR DETERMINING SENSITIVITY TO EPIDERMAL GROWTH FACTOR RECEPTOR MODULATORS

<130> 10159 PCT

<150> US 60/535,151
<151> 2004-01-07

<160> 125

<170> PatentIn version 3.2

<210> 1
<211> 3697
<212> DNA
<213> Homo sapiens

<400> 1
agggagtgtt cccgggggag atactccagt cgtagcaaga gtctcgacca ctgaatggaa 60
gaaaaggact tttaaccacc attttgtgac ttacagaaag gaatttgaat aaagaaaact 120

atgatacttc aggcccatct tcactccctg tgtcttctta tgctttattt ggcaactgga 180

tatggccaag aggggaagtt tagtggaccc ctgaaaccca tgacattttc tatttatgaa 240

ggccaagaac cgagtcaaat tatattccag tttaaggcca atcctcctgc tgtgactttt 300

gaactaactg gggagacaga caacatattt gtgatagaac gggagggact tctgtattac 360

aacagagcct tggacaggga aacaagatct actcacaatc tccaggttgc agccctggac 420

gctaatggaa ttatagtgga gggtccagtc cctatcacca tagaagtgaa ggacatcaac 480

gacaatcgac ccacgtttct ccagtcaaag tacgaaggct cagtaaggca gaactctcgc 540

ccaggaaagc ccttcttgta tgtcaatgcc acagacctgg atgatccggc cactcccaat 600

ggccagcttt attaccagat tgtcatccag cttcccatga tcaacaatgt catgtacttt 660

cagatcaaca acaaaacggg agccatctct cttacccgag agggatctca ggaattgaat 720

cctgctaaga atccttccta taatctggtg atctcagtga aggacatggg aggccagagt 780

gagaattcct tcagtgatac cacatctgtg gatatcatag tgacagagaa tatttggaaa 840

gcaccaaaac ctgtggagat ggtggaaaac tcaactgatc ctcaccccat caaaatcact 900

caggtgcggt ggaatgatcc cggtgcacaa tattccttag ttgacaaaga gaagctgcca 960

agattcccat tttcaattga ccaggaagga gatatttacg tgactcagcc cttggaccga 1020

gaagaaaagg atgcatatgt tttttatgca gttgcaaagg atgagtacgg aaaaccactt 1080

tcatatccgc tggaaattca tgtaaaagtt aaagatatta atgataatcc acctacatgt 1140

ccgtcaccag taaccgtatt tgaggtccag gagaatgaac gactgggtaa cagtatcggg 1200

acccttactg cacatgacag ggatgaagaa aatactgcca acagttttct aaactacagg 1260

attgtggagc aaactcccaa acttcccatg gatggactct tcctaatcca aacctatgct 1320

ggaatgttac agttagctaa acagtccttg aagaagcaag atactcctca gtacaactta 1380

acgatagagg tgtctgacaa agatttcaag acccttttgtt ttgtgcaaat caacgttatt 1440

gatatcaatg atcagatccc catctttgaa aaatcagatt atggaaacct gactcttgct 1500

gaagacacaa acattgggtc caccatctta accatccagg ccactgatgc tgatgagcca 1560

tttactggga gttctaaaat tctgtatcat atcataaagg gagacagtga gggacgcctg 1620

ggggttgaca cagatcccca taccaacacc ggatatgtca taattaaaaa gcctcttgat 1680

tttgaaacag cagctgtttc caacattgtg ttcaaagcag aaaatcctga gcctctagtg 1740

tttggtgtga agtacaatgc aagttctttt gccaagttca cgcttattgt gacagatgtg 1800

aatgaagcac ctcaattttc ccaacacgta ttccaagcga aagtcagtga ggatgtagct 1860

ataggcacta aagtgggcaa tgtgactgcc aaggatccag aaggtctgga cataagctat 1920

tcactgaggg gagacacaag aggttggctt aaaattgacc acgtgactgg tgagatcttt 1980

agtgtggctc cattggacag agaagccgga agtccatatc gggtacaagt ggtggccaca 2040

gaagtagggg ggtcttcctt gagctctgtg tcagagttcc acctgatcct tatggatgtg 2100

aatgacaacc ctcccaggct agccaaggac tacacgggct tgttcttctg ccatcccctc 2160

agtgcacctg gaagtctcat tttcgaggct actgatgatg atcagcactt atttcggggt 2220

ccccatttta cattttccct cggcagtgga agcttacaaa acgactggga agtttccaaa 2280

atcaatggta ctcatgcccg actgtctacc aggcacacag agtttgagga gagggagtat 2340

gtcgtcttga tccgcatcaa tgatgggggt cggccaccct tggaaggcat tgtttcttta 2400

ccagttacat tctgcagttg tgtggaagga agttgtttcc ggccagcagg tcaccagact 2460

gggataccca ctgtgggcat ggcagttggt atactgctga ccacccttct ggtgattggt 2520

ataattttag cagttgtgtt tatccgcata aagaaggata aaggcaaaga taatgttgaa 2580

agtgctcaag catctgaagt caaacctctg agaagctgaa tttgaaaagg aatgtttgaa 2640

tttatatagc aagtgctatt tcagcaacaa ccatctcatc ctattacttt tcatctaacg 2700

tgcattataa ttttttaaac agatattccc tcttgtcctt taatatttgc taaatatttc 2760

ttttttgagg tggagtcttg ctctgtcgcc caggctggag tacagtggtg tgatcccagc 2820

tcactgcaac ctccgcctcc tgggttcaca tgattctcct gcctcagctt cctaagtagc 2880

tgggtttaca ggcacccacc accatgccca gctaattttt gtatttttaa tagagacggg 2940

gtttcgccat ttggccaggc tggtcttgaa ctcctgacgt caagtgatct gcctgccttg 3000

gtctcccaat acaggcatga accactgcac ccacctactt agatatttca tgtgctatag 3060

acattagaga gatttttcat ttttccatga cattttcct ctctgcaaat ggcttagcta 3120

cttgtgtttt tccctttgg ggcaagacag actcattaaa tattctgtac atttttctt 3180

tatcaaggag atatatcagt gttgtctcat agaactgcct ggattccatt tatgtttttt 3240

ctgattccat cctgtgtccc cttcatcctt gactcctttg gtatttcact gaatttcaaa 3300

catttgtcag agaagaaaaa cgtgaggact caggaaaaat aaataaataa aagaacagcc 3360

ttttccctta gtattaacag aaatgtttct gtgtcattaa ccatctttaa tcaatgtgac 3420

atgttgctct ttggctgaaa ttcttcaact tggaaatgac acagacccac agaaggtgtt 3480

caaacacaac ctactctgca aaccttggta aaggaaccag tcagctggcc agatttcctc 3540

actacctgcc atgcatacat gctgcgcatg ttttcttcat tcgtatgtta gtaaagtttt 3600

ggttattata tatttaacat gtggaagaaa acaagacatg aaaagagtgg tgacaaatca 3660

agaataaaca ctggttgtag tcagttttgt ttgttaa 3697

<210> 2
<211> 2249
<212> DNA
<213> Homo sapiens

<400> 2
ctcctctaca aagaggtgga cagagaagac agcagagacc atgggacccc cctcagcccc 60

tccctgcaga ttgcatgtcc cctggaagga ggtcctgctc acagcctcac ttctaacctt 120

ctggaaccca cccaccactg ccaagctcac tattgaatcc acgccattca atgtcgcaga 180

ggggaaggag gttcttctac tcgcccacaa cctgccccag aatcgtattg gttacagctg 240

gtacaaaggc gaaagagtgg atggcaacag tctaattgta ggatatgtaa taggaactca 300

acaagctacc ccagggcccg catacagtgg tcgagagaca atatacccca atgcatccct 360

gctgatccag aacgtcaccc agaatgacac aggattctat accctacaag tcataaagtc 420

agatcttgtg aatgaagaag caaccggaca gttccatgta tacccggagc tgcccaagcc 480

ctccatctcc agcaacaact ccaaccccgt ggaggacaag gatgctgtgg ccttcacctg 540

tgaacctgag gttcagaaca caacctacct gtggtgggta aatggtcaga gcctcccggt 600

cagtcccagg ctgcagctgt ccaatggcaa catgaccctc actctactca gcgtcaaaag 660

gaacgatgca ggatcctatg aatgtgaaat acagaaccca gcgagtgcca accgcagtga 720

cccagtcacc ctgaatgtcc tctatggccc agatgtcccc accatttccc cctcaaaggc 780

caattaccgt ccaggggaaa atctgaacct ctcctgccac gcagcctcta acccacctgc 840

acagtactct tggtttatca atgggacgtt ccagcaatcc acacaagagc tctttatccc 900

caacatcact gtgaataata gcggatccta tatgtgccaa gcccataact cagccactgg 960

cctcaatagg accacagtca cgatgatcac agtctctgga agtgctcctg tcctctcagc 1020

tgtggccacc gtcggcatca cgattggagt gctggccagg gtggctctga tatagcagcc 1080

ctggtgtatt ttcgatattt caggaagact ggcagattgg accagaccct gaattcttct 1140

agctcctcca atcccatttt atcccatgga accactaaaa acaaggtctg ctctgctcct 1200

gaagccctat atgctggaga tggacaactc aatgaaaatt taaagggaaa accctcaggc 1260

ctgaggtgtg tgccactcag agacttcacc taactagaga cagtcaaact gcaaaccatg 1320

gtgagaaatt gacgacttca cactatggac agcttttccc aagatgtcaa aacaagactc 1380

ctcatcatga taaggctctt acccccttt aatttgtcct tgcttatgcc tgcctctttc 1440

gcttggcagg atgatgctgt cattagtatt tcacaagaag tagcttcaga gggtaactta 1500

acagagtgtc agatctatct tgtcaatccc aacgttttac ataaaataag agatccttta 1560

gtgcacccag tgactgacat tagcagcatc tttaacacag ccgtgtgttc aaatgtacag 1620

tggtcctttt cagagttgga cttctagact cacctgttct cactccctgt tttaattcaa 1680

cccagccatg caatgccaaa taatagaatt gctccctacc agctgaacag ggaggagtct 1740
gtgcagtttc tgacacttgt tgttgaacat ggctaaatac aatgggtatc gctgagacta 1800

agttgtagaa attaacaaat gtgctgcttg gttaaaatgg ctacactcat ctgactcatt 1860

ctttattcta ttttagttgg tttgtatctt gcctaaggtg cgtagtccaa ctcttggtat 1920

taccctccta atagtcatac tagtagtcat actccctggt gtagtgtatt ctctaaaagc 1980

tttaaatgtc tgcatgcagc cagccatcaa atagtgaatg gtctctcttt ggctggaatt 2040

acaaaactca gagaaatgtg tcatcaggag aacatcataa cccatgaagg ataaaagccc 2100

caaatggtgg taactgataa tagcactaat gctttaagat ttggtcacac tctcacctag 2160

gtgagcgcat tgagccagtg gtgctaaatg ctacatactc caactgaaat gttaaggaag 2220

aagatagatc caaaaaaaaa aaaaaaaaa 2249

<210> 3
<211> 2533
<212> DNA
<213> Homo sapiens

<400> 3
ggagctcaag ctcctctaca aagaggtgga cagagaagac agcagagacc atgggacccc 60

cctcagcccc tccctgcaga ttgcatgtcc cctggaagga ggtcctgctc acagcctcac 120

ttctaacctt ctggaaccca cccaccactg ccaagctcac tattgaatcc acgccattca 180

atgtcgcaga ggggaaggag gttcttctac tcgcccacaa cctgccccag aatcgtattg 240

gttacagctg gtacaaaggc gaaagagtgg atggcaacag tctaattgta ggatatgtaa 300

taggaactca acaagctacc ccagggcccg catacagtgg tcgagagaca atatacccca 360

atgcatccct gctgatccag aacgtcaccc agaatgacac aggattctat accctacaag 420

tcataaagtc agatcttgtg aatgaagaag caaccggaca gttccatgta tacccggagc 480

tgcccaagcc ctccatctcc agcaacaact ccaaccccgt ggaggacaag gatgctgtgg 540

ccttcacctg tgaacctgag gttcagaaca caacctacct gtggtgggta aatggtcaga 600

gcctcccggt cagtcccagg ctgcagctgt ccaatggcaa catgaccctc actctactca 660

gcgtcaaaag gaacgatgca ggatcctatg aatgtgaaat acagaaccca gcgagtgcca 720

accgcagtga cccagtcacc ctgaatgtcc tctatggccc agatgtcccc accatttccc 780

cctcaaaggc caattaccgt ccaggggaaa atctgaacct ctcctgccac gcagcctcta 840

acccacctgc acagtactct tggtttatca atgggacgtt ccagcaatcc acacaagagc 900

tctttatccc caacatcact gtgaataata gcggatccta tatgtgccaa gcccataact 960

cagccactgg cctcaatagg accacagtca cgatgatcac agtctctgga agtgctcctg 1020

tcctctcagc tgtggccacc gtcggcatca cgattggagt gctggccagg gtggctctga 1080

tatagcagcc ctggtgtatt ttcgatattt caggaagact ggcagattgg accagaccct 1140

gaattcttct agctcctcca atcccatttt atcccatgga accactaaaa acaaggtctg 1200

ctctgctcct gaagccctat atgctggaga tggacaactc aatgaaaatt taaagggaaa 1260

accctcaggc ctgaggtgtg tgccactcag agacttcacc taactagaga cagtcaaact 1320

gcaaaccatg gtgagaaatt gacgacttca cactatggac agcttttccc aagatgtcaa 1380

aacaagactc ctcatcatga taaggctctt acccccttt aatttgtcct tgcttatgcc 1440

tgcctctttc gcttggcagg atgatgctgt cattagtatt tcacaagaag tagcttcaga 1500

gggtaactta acagagtgtc agatctatct tgtcaatccc aacgttttac ataaaataag 1560

agatccttta gtgcacccag tgactgacat tagcagcatc tttaacacag ccgtgtgttc 1620

aaatgtacag tggtcctttt cagagttgga cttctagact cacctgttct cactccctgt 1680

tttaattcaa cccagccatg caatgccaaa taatagaatt gctccctacc agctgaacag 1740

ggaggagtct gtgcagtttc tgacacttgt tgttgaacat ggctaaatac aatgggtatc 1800

gctgagacta agttgtagaa attaacaaat gtgctgcttg gttaaaatgg ctacactcat 1860

ctgactcatt ctttattcta ttttagttgg tttgtatctt gcctaaggtg cgtagtccaa 1920

ctcttggtat taccctccta atagtcatac tagtagtcat actccctggt gtagtgtatt 1980

ctctaaaagc tttaaatgtc tgcatgcagc cagccatcaa atagtgaatg gtctctcttt 2040

ggctggaatt acaaaactca gagaaatgtg tcatcaggag aacatcataa cccatgaagg 2100

ataaaagccc caaatggtgg taactgataa tagcactaat gctttaagat ttggtcacac 2160

tctcacctag gtgagcgcat tgagccagtg gtgctaaatg ctacatactc caactgaaat 2220

gttaaggaag aagatagatc caattaaaaa aaattaaaac caatttaaaa aaaaaaaaga 2280

acacaggaga ttccagtcta cttgagttag cataatacag aagtcccctc tactttaact 2340

tttacaaaaa agtaacctga actaatctga tgttaaccaa tgtatttatt tctgtggttc 2400

tgtttccttg ttccaatttg acaaaaccca ctgttcttgt attgtattgc ccaggggggag 2460

ctatcactgt acttgtagag tggtgctgct ttaattcata aatcacaaat aaaagccaat 2520

tagctctata act 2533

<210> 4
<211> 543
<212> DNA
<213> Homo sapiens

<400> 4
tcttctgaca gctggtgcgc ctgcccggga acatcctcct ggactcaatc atggcttgtg 60

gtctggtcgc cagcaacctg aatctcaaac ctggagagtg ccttcgagtg cgaggcgagg 120

tggctcctga cgctaagagc ttcgtgctga acctgggcaa agacagcaac aacctgtgcc 180

tgcacttcaa ccctcgcttc aacgcccacg gcgacgccaa caccatcgtg tgcaacagca 240

aggacggcgg ggcctggggg accgagcagc gggaggctgt ctttcccttc cagcctggaa 300

gtgttgcaga ggtgtgcatc accttcgacc aggccaacct gaccgtcaag ctgccagatg 360

gatacgaatt caagttcccc aaccgcctca acctggaggc catcaactac atggcagctg 420

acggtgactt caagatcaaa tgtgtggcct ttgactgaaa tcagccagcc catggccccc 480

aataaaggca gctgcctctg ctccctctga aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 540

aaa 543

<210> 5
<211> 1740
<212> DNA
<213> Homo sapiens

<400> 5
gaggcggagg cggaggcgga gggcgagggg cggggagcgc cgcctggagc gcggcaggtc 60

atattgaaca ttccagatac ctatcattac tcgatgctgt tgataacagc aagatggctt 120

tgaactcagg gtcaccacca gctattggac cttactatga aaaccatgga taccaaccgg 180

aaaaccccta tcccgcacag cccactgtgg tccccactgt ctacgaggtg catccggctc 240

agtactaccc gtcccccgtg ccccagtacg ccccgagggt cctgacgcag gcttccaacc 300

ccgtcgtctg cacgcagccc aaatccccat ccgggacagt gtgcacctca aagactaaga 360

aagcactgtg catcaccttg accctgggga ccttcctcgt gggagctgcg ctggccgctg 420

gcctactctg gaagttcatg ggcagcaagt gctccaactc tgggatagag tgcgactcct 480

caggtacctg catcaacccc tctaactggt gtgatggcgt gtcacactgc cccggcgggg 540

aggacgagaa tcggtgtgtt cgcctctacg gaccaaactt catccttcag gtgtactcat 600

ctcagaggaa gtcctggcac cctgtgtgcc aagacgactg gaacgagaac tacgggcggg 660

cggcctgcag ggacatgggc tataagaata atttttactc tagccaagga atagtggatg 720

acagcggatc caccagcttt atgaaactga acacaagtgc cggcaatgtc gatatctata 780

aaaaactgta ccacagtgat gcctgttctt caaaagcagt ggtttcttta cgctgtatag 840

cctgcggggt caacttgaac tcaagccgcc agagcaggat tgtgggcggc gagagcgcgc 900

tcccgggggc ctggccctgg caggtcagcc tgcacgtcca gaacgtccac gtgtgcggag 960

gctccatcat caccccgag tggatcgtga cagccgccca ctgcgtggaa aaacctctta 1020

acaatccatg gcattggacg gcatttgcgg ggattttgag acaatctttc atgttctatg 1080

gagccggata ccaagtagaa aaagtgattt ctcatccaaa ttatgactcc aagaccaaga 1140

acaatgacat tgcgctgatg aagctgcaga agcctctgac tttcaacgac ctagtgaaac 1200

cagtgtgtct gcccaaccca ggcatgatgc tgcagccaga acagctctgc tggatttccg 1260

ggtgggggc caccgaggag aaagggaaga cctcagaagt gctgaacgct gccaaggtgc 1320

ttctcattga gacacagaga tgcaacagca gatatgtcta tgacaacctg atcacaccag 1380

ccatgatctg tgccggcttc ctgcagggga acgtcgattc ttgccagggt gacagtggag 1440

ggcctctggt cacttcgaag aacaatatct ggtggctgat aggggataca agctggggtt 1500

ctggctgtgc caaagcttac agaccaggag tgtacgggaa tgtgatggta ttcacggact 1560

ggatttatcg acaaatgagg gcagacggct aatccacatg gtcttcgtcc ttgacgtcgt 1620

tttacaagaa aacaatgggg ctggttttgc ttccccgtgc atgatttact cttagagatg 1680

attcagaggt cacttcattt ttattaaaca gtgaacttgt ctggcaaaaa aaaaaaaaaa 1740

<210> 6
<211> 713
<212> DNA
<213> Homo sapiens

<400> 6
tttttggggt ttttttgcaa aatgctcaag ggtatttatg caacagattg gccgtgtact 60

gaggaggggа gcgcaggctg agggctgagg taggagtgag gttcttcctc ctgcagccac 120

caggcagctg atcaccatgt ccaagcgtca ttcctgagac cctcaggtga tgctcacgtc 180

cccagaacag caggctggat gcatggccag aggagctcgg ccagccccgg ggctggtcct 240

gagaggtggc tgcaggcggg gtgggtaagg gcccctcctc caggcagcag gtgacccata 300

gcccacaccc tccacaagaa agcgggcgtg gacagtgtgt tcaaagctgc agccgcctgg 360

acaggggcac aagttccact ggccttggaa gccgagctca gaggacatat gggaggttct 420

ccttggaggt caggagggcg gcagtgctgg tcagtgcatg ggggacactg ggacgcctct 480

ctcccagctc ccactctctg cctcctggct gggctcgggt tccgcctcct tcgagtgctt 540

gtgttgcccg gcgcaaggca ccgccggccc atgcagccgc actcttccac ctcgtgtagc 600

tgaaaggccg ggctggagcc gccgggccgt gcaggggcac aattcctaca cgaggtccgc 660

agctccttgc aagcactgca cctgtgcttc caacggttgc ccttcggcga gta 713

<210> 7
<211> 7382
<212> DNA
<213> Homo sapiens

<400> 7
tgctgaggga cagggcactc ttccccgccg tccacacaat gagtgttggc cggaggaagc 60

tggccctgct ctgggccctg gctctcgctc tggcctgcac ccggcacaca ggccatgccc 120

aggatggctc ctccgaatcc agctacaagc accaccctgc cctctctcct atcgcccggg 180

ggcccagcgg ggtcccgctc cgtggggcga ctgtcttccc atctctgagg accatccctg 240

tggtacgagc ctccaaccca gcgcacaacg ggcgggtgtg cagcacctgg ggcagcttcc 300

actacaagac cttcgacggc gacgtcttcc gcttccccgg cctctgcaac tacgtgttct 360

ccgagcactg cggtgccgcc tacgaggatt ttaacatcca gctacgccgc agccaggagt 420

cagcggcccc cacgctgagc agggtcctca tgaaggtgga tggcgtggtc atccagctga 480

ccaagggctc cgtcctggtc aacggccacc cggtcctgct gcccttcagc cagtctgggg 540

tcctcattca gcagagcagc agctacacca aggtggaggc caggctgggc cttgtcctca 600

tgtggaacca cgatgacagc ctgctgctgg agctggacac caaatacgcc aacaagacct 660

gtgggctctg tggggacttc aacgggatgc ccgtggtcag cgagctcctc tcccacaaca 720

ccaagctgac acccatggaa ttcgggaacc tgcagaagat ggacgacccc acggagcagt 780

gtcaggaccc tgtccctgaa cccccgagga actgctccac tggctttggc atctgtgagg 840

agctcctgca cggccagctg ttctctggct gcgtggccct ggtggacgtc ggcagctacc 900

tggaggcttg caggcaagac ctctgcttct gtgaagacac cgacctgctc agctgcgtct 960

gccacaccct tgccgagtac tcccggcagt gcacccatgc agggggggttg ccccaggact 1020

ggcggggccc tgacttctgc ccccagaagt gccccaacaa catgcagtac cacgagtgcc 1080

gctccccctg cgcagacacc tgctccaacc aggagcactc ccgggcctgt gaggaccact 1140

gtgtggccgg ctgcttctgc cctgagggga cggtgcttga cgacatcggc cagaccggct 1200

gtgtccctgt gtcaaagtgt gcctgcgtct acaacggggc tgcctatgcc ccaggggcca 1260

cctactccac agactgcacc aactgcacct gctccggagg ccggtggagc tgccaggagg 1320

ttccatgccc ggatacctgc tctgtgcttg gaggtgccca cttctcaacg tttgacggga 1380

agcaatacac ggtgcacggc gactgcagct atgtgctgac caagccctgt gacagcagtg 1440

ccttcactgt actggctgag ctgcgcaggt gcgggctgac ggacagcgag acctgcctga 1500

agagcgtgac actgagcctg gatggggcgc agacggtggt ggtgatcaag gccagtgggg 1560

aagtgttcct gaaccagatc tacacccagc tgcccatctc tgcagccaac gtcaccatct 1620

tcagaccctc aaccttcttc atcatcgccc agaccagcct gggcctgcag ctgaacctgc 1680

agccggtgcc caccatgcag ctgttcatgc agctggcgcc caagctccgt gggcagacct 1740

gcggtctctg tgggaacttc aacagcatcc aggccgatga cttccggacc ctcagtgggg 1800

tggtggaggc caccgctgcg gccttcttca acaccttcaa gacccaggcc gcctgcccca 1860

acatcaggaa cagcttcgag gacccctgct ctctgagcgt ggagaatgag aagtatgctc 1920

agcactggtg ctcgcagctg accgatgccg acggcccctt cggccggtgc catgctgccg 1980

tgaagccggg aacctactac tcgaactgcg tgtttgacac ctgcaactgt gagcggagcg 2040

aggactgcct gtgcgccgcg ctgtcctcct acgtgcacgc ctgtgccgcc aagggcgtgc 2100

agctcggcgg ctggagggac ggcgtctgca cgaagcctat gaccacttgc cccaagtcaa 2160

tgacgtacca ctaccatgtc agcacctgcc agcccacctg ccgctccctg agcgaggggg 2220

acatcacctg cagtgttggc ttcatccccg tggatggctg catctgtccc aagggcacct 2280

tcctggacga cacgggcaag tgtgtgcagg ccagcaactg tccctgctac cacagaggct 2340

ccatgatccc caatggggag tcggtgcacg acagcggggc tatctgcacc tgcacacatg 2400

ggaagctgag ctgcatcgga ggccaagccc ccgccccagt gtgtgctgcg cccatggtgt 2460

tctttgactg ccgaaatgcc acgcccgggg acacaggggc tggctgtcag aagagctgcc 2520

acacactgga catgacctgt tacagccccc agtgtgtgcc tggctgcgtg tgccccgacg 2580

ggctggtggc ggacggcgag ggcggctgca tcactgcgga ggactgcccc tgcgtgcaca 2640
atgaggccag ctaccgggcc ggccagacca tccgggtggg ctgcaacacc tgcacctgtg 2700

acagcaggat gtggcggtgc acagatgacc cctgcctggc cacctgcgcc gtgtacgggg 2760

acggccacta cctcaccttc gacggacaga gctacagctt caacggagac tgcgagtaca 2820

cgctggtgca gaaccactgt ggcgggaaag acagcaccca ggactccttt cgtgttgtca 2880

ccgagaacgt cccctgcggc accacaggga ccacctgctc caaggccatc aagattttcc 2940

tgggggggctt cgagctgaag ctaagccatg ggaaggtgga ggtgatcggg acggacgaga 3000

gccaggaggt gccatacacc atccagcaga tgggcatcta cctggtggtg gacaccgaca 3060

ttggcctggt gctgctgtgg gacaagaaga ccagcatctt catcaacctc agccccgagt 3120

tcaagggcag ggtctgcggc ctgtgtggga acttcgacga catcgccgtt aatgactttg 3180

ccacgcggag ccggtctgtg gtgggggacg tgctggagtt tgggaacagc tggaagctct 3240

ccccctcctg cccagatgcc ctggcgccca aggacccctg cacggccaac cccttccgca 3300

agtcctgggc ccagaagcag tgcagcatcc tccacggccc caccttcgcc gcctgccacg 3360

cacacgtgga gccggccagg tactacgagg cctgcgtgaa cgacgcgtgc gcctgcgact 3420

ccgggggtga ctgcgagtgc ttctgcacgg ctgtggccgc ctacgcccag gcctgccatg 3480

aagtaggcct gtgtgtgtgt ctgcggaccc cgagcatctg ccctctgttc tgcgactact 3540

acaaccccga aggccagtgc gagtggcact accagccctg cggggtgccc tgcctgcgca 3600

cctgccggaa cccccgtgga gactgtctgc gggacgtccg ggggctggaa ggctgctacc 3660

ccaagtgccc accagaggct cccatctttg atgaggacaa gatgcagtgt gtggccacct 3720

gcccaacccc gcctctgcca ccacggtgcc acgtccatgg gaagtcctac cggccaggtg 3780

cagtggtgcc ctcggacaag aactgccagt cctgcctttg tacggagcgc ggcgtggagt 3840

gcacctacaa agctgaggcc tgtgtctgca cctacaatgg acagcgcttc cacccagggg 3900

acgtcatcta ccacacgacg gatggcacgg gtggctgcat ctccgcccgc tgcggggcca 3960

acggcaccat tgagaggagg gtctaccccct gcagccccac cacccctgtc cccccaacca 4020

ccttctcctt ctccacaccc ccgcttgtcg tgagctccac gcacacccccc agcaatggcc 4080

caagcagcgc gcacacaggc cctccgagca gcgcctggcc caccacagca ggcacttctc 4140

ccaggacgag gctgcccaca gcctctgcct cgctgccgcc ggtctgtggg gaaaagtgcc 4200

tctggtcgcc atggatggat gtcagccgcc ctggacgggg cacggacagc ggtgacttcg 4260

acacactgga gaacctccgc gcccatgggt accgggtgtg cgaatcaccc aggtcggtgg 4320

agtgccgagc tgaggacgcc cccggagtgc cgctccgagc cctggggcag cgtgtgcagt 4380

gcagcccgga tgtggggctg acctgtcgta acagggagca ggcatcgggg ctctgctaca 4440

actaccagat cagggtccag tgctgcacgc ccctaccctg ctccacctct agcagtccag 4500

cccagaccac tcctccaact acctccaaga ccactgaaac ccgggcctca ggctcctcag 4560

ctcccagcag cacacctggc accgtgtctc tctccacagc caggacgaca cctgccccag 4620

gtaccgctac ctctgtcaaa aaaactttct caactcccag ccctccgcca gtgccggcaa 4680

catcaacatc atccatgtcg accacggccc cggggacctc tgtggtctcc agcaagccca 4740

ccccacggga gcccagcaca tcctcctgcc tgcaggagct ttgcacctgg accgagtgga 4800

tcgatggcag ctaccctgct cctggaataa atggtggaga ttttgacaca tttcaaaatt 4860

tgagagacga aggatacaca ttctgtgaaa gtcctcgaag cgtgcagtgc cgggcagaga 4920

gcttccccaa cacgccgctg gcagacctgg ggcaggacgt catctgcagc cacacagagg 4980

ggctgatttg cctgaacaag aaccagctcc cacccatctg ctacaactat gagatccgca 5040

tccagtgttg cgagacggtg aacgtgtgca gagacatcac cagactgcca aagaccgtcg 5100

caacgacacg gccgactcca catccaaccg gagctcagac ccagaccacc ttcaccacac 5160

acatgccctc ggcctccaca gagcaaccca cggcaacctc caggggtggg cccacagcaa 5220

ccagcgtcac acagggcacc cacaccacac tagtcaccag aaactgtcat ccccggtgca 5280

cctggacaaa gtggttcgac gtggacttcc cgtcccccgg accccatggt ggagacaagg 5340

aaacctacaa caacatcatc aggagtgggg aaaaaatctg ccgccgacct gaggagatca 5400

ccagggtcca gtgccgagcc aagagccacc cagaggtgag catcgaacac ctgggccagg 5460

tggtgcagtg cagccgggaa gagggcctgg tgtgccggaa ccaggaccag cagggaccct 5520

tcaagatgtg cctcaactac gaggtgcgtg tgctctgctg cgagaccccc agaggctgcc 5580

acatgacctc cacacctggc tccacctcta gcagtccagc ccagaccact ccttcaacaa 5640

cctccaagac cactgaaatc caggcctcag gctcctcagc ccccagcagc acacctggca 5700

ccgtgtctct ctctacagcc aggacgacac ctgccccagg taccgctacc tctgtcaaaa 5760

aaactttctc aactcccagc cctccgccag tgccggcaac atcaacatca tccatgtcga 5820

ccacggcccc ggggacctct gtggtctcca gcaagcccac ccccacggag cccagcacat 5880

cctcctgcct gcaggagctt tgcacctgga ccgagtggat tgatggcagc taccctgctc 5940

ctggaataaa tggtggagat tttgacacat ttcaaaattt gagagacgaa ggatacacat 6000

tctgtgaaag tcctcgaagc gtgcagtgcc gggcagagag cttccccaac acgccgctgg 6060

gcagactggg gcaggacgtc atctgcagcc acacagaggg gctgatttgc ctgaacaaga 6120

accagctccc acccatctgc tacaactatg agatccgaat ccagtgttgc gagacggtga 6180

acgtgtgcag agacatcacc agaccgccaa agaccgtcgc aacgacgcgg ccgactccac 6240

atccaaccgg agctcagacc cagaccacct tcaccacaca catgccctcg gcctccacag 6300

agcaacccac ggcaacctcc aggggtgggc ccacagcaac cagcgtcaca cagggcaccc 6360

acaccacacc agtcaccaga aactgtcatc cccggtgcac ctggacaacg tggttcgacg 6420

tggacttccc gtccccggga ccccatggtg gagacaagga aacctacaac aacatcatca 6480
ggagtgggga aaaaatctgc cgccgacctg aggagatcac caggctccag tgccgagcca 6540

agagccaccc agaggtgagc atcgaacacc tgggccaggt ggtgcagtgc agccgggaag 6600

agggcctggt gtgccggaac caggaccagc agggaccctt caagatgtgc ctcaacatcg 6660

aggtgcgtgt gctctgctgc gagaccccca aaggctgccc cgtgacctcc acacctgtga 6720

cagctcctag cacccctagt gggagagcca tcagcccaac tcagagcacc tcctcttggc 6780

agaaatccag gacaaccact ttggtgacaa ccagcacaac ctccactcca cagaccagta 6840

caacctatgc ccatacaacc agcacaacct ctgctcctac agccagaaca acctctgctc 6900

ctacaaccag cacaacttct gtccctacaa ccagcacaat ctctggtcct aaaactactc 6960

cgagccctgt tcctaccacc agcacaacct ctgctgctac aacaagcaca atctctgctc 7020

ctacaacgag cacaacttct gtccctggaa ctactcccag ccctgttctc accaccagca 7080

caacctctgc tcctacaacc agaacaacct ctgcctctcc agccggcaca acctctggtc 7140

ctggaaatac tcccagccct gttcctacca ccagcacaat ctctgctcct acaactagca 7200

taacctctgc ccctacaacc agcacaacct ctgcccctac aagcagcaca acctctggtc 7260

ctggaactac tcccagccct gttcctacca ccagcataac ctctgccct acaaccagca 7320

caacctctgc tcctacaacc agcacaacct ctgctcccac aacgagcacg acttctgccc 7380

ct 7382

<210> 8
<211> 2058
<212> DNA
<213> Homo sapiens

<400> 8
cggtttctgc tgggtttctg aactgctggg tttctgcttg ctcctctgga gatgcagcgt 60

ctgttgactc cagtgaagcg cattctgcaa ctgacaagag cggtgcagga aacctccctc 120

acacctgctc gcctgctccc agtagcccac caaaggtttt ctacagcctc tgctgtcccc 180

ctggccaaaa cagatacttg gccaaaggac gtgggcatcc tggccctgga ggtctacttc 240

ccagcccaat atgtggacca aactgacctg gagaagtata acaatgtgga agcaggaaag 300

tatacagtgg gcttgggcca gacccgtatg ggcttctgct cagtccaaga ggacatcaac 360

tccctgtgcc tgacggtggt gcaacggctg atggagcgca tacagctccc atgggactct 420

gtgggcaggc tggaagtagg cactgagacc atcattgaca agtccaaagc tgtcaaaaca 480

gtgctcatgg aactcttcca ggattcaggc aatactgata ttgagggcat agataccacc 540

aatgcctgct acggtggtac tgcctccctc ttcaatgctg ccaactggat ggagtccagt 600

tcctgggatg gtcgttatgc catggtggtc tgtggagaca ttgccgtcta tcccagtggt 660

aatgctcgtc ccacaggtgg ggccggagct gtggctatgc tgattggccc aaaggcccct 720

ctggccctgg agcgagggct gaggggaacc catatggaga atgtgtatga cttctacaaa 780

ccaaatttgg cctcggagta cccaatagtg gatgggaagc tttccatcca gtgctacttg 840

cgggccttgg atcgatgtta cacatcatac cgtaaaaaaa tccagaatca gtggaagcaa 900

gctggcagcg atcgaccctt cacccttgac gatttacagt atatgatctt tcatacaccc 960

ttttgcaaga tggtccagaa gtctctggct cgcctgatgt tcaatgactt cctgtcagcc 1020

agcagtgaca cacaaaccag cttatataag gggctggagg ctttcggggg gctaaagctg 1080

gaagacacct acaccaacaa ggacctggat aaagcacttc taaaggcctc tcaggacatg 1140

ttcgacaaga aaaccaaggc ttccctttac ctctccactc acaatgggaa catgtacacc 1200

tcatccctgt acgggtgcct ggcctcgctt ctgtcccacc actctgccca agaactggct 1260

ggctccagga ttggtgcctt ctcttatggc tctggtttag cagcaagttt cttttcattt 1320

cgagtatccc aggatgctgc tccaggctct cccctggaca agttggtgtc cagcacatca 1380

gacctgccaa aacgcctagc ctcccgaaag tgtgtgtctc ctgaggagtt cacagaaata 1440

atgaaccaaa gagagcaatt ctaccataag gtgaatttct ccccacctgg tgacacaaac 1500

agccttttcc caggtacttg gtacctggag cgagtggacg agcagcatcg ccgaaagtat 1560

gcccggcgtc ccgtctaaag gtgttctgca gatccatgga aagcttcctg ggaaacgtat 1620

gctagcagag cttctccccg tgaatcatat ttttaagatc ccactcttag ctggtaaatg 1680

aatttgaatc gacatagtag ccccataagc atcagccctg tagagtgagg agccatctct 1740

agcgggccct tcattcctct ccatgctgca atcactgtcc tgggcttatg gtgcctatgg 1800

actaggggtc ctttgtgaaa gagcaagatg gagcaatgga gagaagacct cttcctgaat 1860

cactggactc cagaaatgtg catgcagatc agctgttgcc ttcaagatcc agataaactt 1920

tcctgtcatg tgttagaact ttattattat taatattgtt aaacttctgt gctgttcctg 1980

tgaatctcca aattttgtac cttgttctaa gctaatatat agcaattaaa aagagagaaa 2040

gagaaaaaaa aaaaaaaa 2058

<210> 9
<211> 634
<212> DNA
<213> Homo sapiens

<400> 9
cggctgagag gcagcgaact catctttgcc agtacaggag cttgtgccgt ggcccacagc 60

ccacagccca cagccatggg ctgggacctg acggtgaaga tgctggcggg caacgaattc 120

caggtgtccc tgagcagctc catgtcggtg tcagagctga aggcgcagat cacccagaag 180

attggcgtgc acgccttcca gcagcgtctg gctgtccacc cgagcggtgt ggcgctgcag 240

gacagggtcc cccttgccag ccagggcctg ggccctggca gcacggtcct gctggtggtg 300

gacaaatgcg acgaacctct gagcatcctg gtgaggaata acaagggccg cagcagcacc 360

tacgaggtcc ggctgacgca gaccgtggcc cacctgaagc agcaagtgag cgggctggag 420

ggtgtgcagg acgacctgtt ctggctgacc ttcgagggga agcccctgga ggaccagctc 480

ccgctggggg agtacggcct caagcccctg agcaccgtgt tcatgaatct gcgcctgcgg 540

ggaggcggca cagagcctgg cgggcggagc taagggcctc caccagcatc cgagcaggat 600

caagggccgg aaataaaggc tgttgtaaga gaat 634

<210> 10<211> 1959
<212> DNA
<213> Homo sapiens

<400> 10
gggcacgagg gaggacagag agcaagtcac tcccggctgc ctttttcacc tctgacagag 60

cccagacacc atgaacgcaa gtgaattccg aaggagaggg aaggagatgg tggattacgt 120

ggccaactac atggaaggca ttgagggacg ccaggtctac cctgacgtgg agcccgggta 180

cctgcggccg ctgatccctg ccgctgcccc tcaggagcca gacacgtttg aggacatcat 240

caacgacgtt gagaagataa tcatgcctgg ggtgacgcac tggcacagcc cctacttctt 300

cgcctacttc cccactgcca gctcgtaccc ggccatgctt gcggacatgc tgtgcggggc 360

cattggctgc atcggcttct cctgggcggc aagcccagca tgcacagagc tggagactgt 420

gatgatggac tggctcggga agatgctgga actaccaaag gcatttttga atgagaaagc 480

tggagaaggg ggaggagtga tccagggaag tgccagtgaa gccaccctgg tggccctgct 540

ggccgctcgg accaaagtga tccatcggct gcaggcagcg tccccagagc tcacacaggc 600

cgctatcatg gagaagctgg tggcttactc atccgatcag gcacactcct cagtggaaag 660

agctgggtta attggtggag tgaaattaaa agccatcccc tcagatggca acttcgccat 720

gcgtgcgtct gccctgcagg aagccctgga gagagacaaa gcggctggcc tgattccttt 780

ctttatggtt gccaccctgg ggaccacaac atgctgctcc tttgacaatc tcttagaagt 840

cggtcctatc tgcaacaagg aagacatatg gctgcacgtt gatgcagcct acgcaggcag 900

tgcattcatc tgccctgagt tccggcacct tctgaatgga gtggagtttg cagattcatt 960

caactttaat ccccacaaat ggctattggt gaattttgac tgttctgcca tgtgggtgaa 1020

aaagagaaca gacttaacgg gagcctttag actggacccc acttacctga agcacagcca 1080

tcaggattca gggcttatca ctgactaccg gcattggcag ataccactgg gcagaagatt 1140

tcgctctttg aaaatgtggt ttgtatttag gatgtatgga gtcaaaggac tgcaggctta 1200

tatccgcaag catgtccagc tgtcccatga gtttgagtca ctggtgcgcc aggatccccg 1260

ctttgaaatc tgtgtggaag tcattctggg gcttgtctgc tttcggctaa agggttccaa 1320

caaagtgaat gaagctcttc tgcaaagaat aaacagtgcc aaaaaaatcc acttggttcc 1380

atgtcacctc agggacaagt ttgtcctgcg ctttgccatc tgttctcgca cggtggaatc 1440

tgcccatgtg cagcgggcct gggaacacat caaagagctg gcggccgacg tgctgcgagc 1500

agagagggag taggagtgaa gccagctgca ggaatcaaaa attgaagaga gatatatctg 1560

aaaactggaa taagaagcaa ataaatatca tcctgccttc atggaactca gctgtctgtg 1620

gcttcccatg tctttctcca aagttatcca gagggttgtg attttgtctg cttagtatct 1680

catcaacaaa gaaatattat ttgctaatta aaaagttaat cttcatggcc atagctttta 1740

ttcattagct gtgatttttg ttgattaaaa cattatagat tttcatgttc ttgcagtcat 1800

cagaagtggt aggaaagcct cactgatata ttttccaggg caatcaatgt tcacgcaact 1860

tgaaattata tctgtggtct tcaaattgtc ttttgtcatg tggctaaatg cctaataaac 1920

aattcaagtg aaatactaaa aaaaaaaaaa aaaaaaaaa 1959

<210> 11
<211> 2876
<212> DNA
<213> Homo sapiens

<400> 11
gaattcctgc agctcagcag ccgccgccag agcaggacga accgccaatc gcaaggcacc 60

tctgagaact tcaggatgca gatgtctcca gccctcacct gcctagtcct gggcctggcc 120

cttgtctttg gtgaagggtc tgctgtgcac catcccccat cctacgtggc ccacctggcc 180

tcagacttcg gggtgagggt gtttcagcag gtggcgcagg cctccaagga ccgcaacgtg 240

gttttctcac cctatggggt ggcctcggtg ttggccatgc tccagctgac aacaggagga 300

gaaacccagc agcagattca agcagctatg ggattcaaga ttgatgacaa gggcatggcc 360

cccgccctcc ggcatctgta caaggagctc atggggccat ggaacaagga tgagatcagc 420

accacagacg cgatcttcgt ccagcgggat ctgaagctgg tccagggctt catgccccac 480

ttcttcaggc tgttccggag cacggtcaag caagtggact tttcagaggt ggagagagcc 540

agattcatca tcaatgactg ggtgaagaca cacacaaaag gtatgatcag caacttgctt 600

gggaaaggag ccgtggacca gctgacacgg ctggtgctgg tgaatgccct ctacttcaac 660

ggccagtgga agactccctt ccccgactcc agcacccacc gccgcctctt ccacaaatca 720

gacggcagca ctgtctctgt gcccatgatg gctcagacca acaagttcaa ctatactgag 780

ttcaccacgc ccgatggcca ttactacgac atcctggaac tgccctacca cggggacacc 840

ctcagcatgt tcattgctgc cccttatgaa aaagaggtgc ctctctctgc cctcaccaac 900

attctgagtg cccagctcat cagccactgg aaaggcaaca tgaccaggct gccccgcctc 960

ctggttctgc ccaagttctc cctggagact gaagtcgacc tcaggaagcc cctagagaac 1020

ctgggaatga ccgacatgtt cagacagttt caggctgact tcacgagtct ttcagaccaa 1080

gagcctctcc acgtcgcgca ggcgctgcag aaagtgaaga tcgaggtgaa cgagagtggc 1140

acggtggcct cctcatccac agctgtcata gtctcagccc gcatggcccc cgaggagatc 1200

atcatggaca gacccttcct ctttgtggtc cggcacaacc ccacaggaac agtccttttc 1260

atgggccaag tgatggaacc ctgaccctgg ggaaagacgc cttcatctgg gacaaaactg 1320

gagatgcatc gggaaagaag aaactccgaa gaaaagaatt ttagtgttaa tgactctttc 1380

tgaaggaaga gaagacattt gccttttgtt aaaagatggt aaaccagatc tgtctccaag 1440

accttggcct ctccttggag gacctttagg tcaaactccc tagtctccac ctgagaccct 1500

gggagagaag tttgaagcac aactccctta aggtctccaa accagacggt gacgcctgcg 1560

ggaccatctg gggcacctgc ttccacccgt ctctctgccc actcgggtct gcagacctgg 1620

ttcccactga ggccctttgc aggatggaac tacggggctt acaggagctt ttgtgtgcct 1680

ggtagaaact atttctgttc cagtcacatt gccatcactc ttgtactgcc tgccaccgcg 1740

gaggaggctg gtgacaggcc aaaggccagt ggaagaaaca ccctttcatc tcagagtcca 1800

ctgtggcact ggccaccccc ccccagtaca ggggtgctgc aggtggcaga gtgaatgtcc 1860

cccatcatgt ggcccaactc tcctggcctg gccatctccc tccccagaaa cagtgtgcat 1920

gggttatttt ggagtgtagg tgacttgttt actcattgaa gcagatttct gcttcctttt 1980

atttttatag gaatagagga agaaatgtca gatgcgtgcc cagctcttca ccccccaatc 2040

tcttggtggg gaggggtgta cctaaatatt tatcatatcc ttgcccttga gtgcttgtta 2100

gagagaaaga gaactactaa ggaaaataat attatttaaa ctcgctccta gtgtttcttt 2160

gtggtctgtg tcaccgtatc tcaggaagtc cagccacttg actggcacac acccctccgg 2220

acatccagcg tgacggagcc cacactgcca ccttgtggcc gcctgagacc ctcgcgcccc 2280

ccgcgccccc cgcgcccctc tttttccccc tgatggaaat tgaccataca atttcatcct 2340

ccttcagggg atcaaaagga cggagtgggg ggacagagac tcagatgagg acagagtggt 2400

ttccaatgtg ttcaatagat ttaggagcag aaatgcaagg ggctgcatga cctaccagga 2460

cagaactttc cccaattaca gggtgactca cagccgcatt ggtgactcac ttcaatgtgt 2520

catttccggc tgctgtgtgt gagcagtgga cacgtgaggg gggggtgggt gagagagaca 2580

ggcagctcgg attcaactac cttagataat atttctgaaa acctaccagc cagagggtag 2640

ggcacaaaga tggatgtaat gcactttggg aggccaaggc gggaggattg cttgagccca 2700

ggagttcaag accagcctgg gcaacatacc aagaccccca tctctttaaa aatatatata 2760

ttttaaatat acttaaatat atatttctaa tatctttaaa tatatatata tattttaaag 2820

accaatttat gggagaattg cacacagatg tgaaatgaat gtaatctaat agaagc 2876

<210> 12
<211> 1304
<212> DNA
<213> Homo sapiens

<400> 12
gttctccaca actgccagca atccttccac caggcaaaac acatcatcta aggaaaagaa 60

gtgaggtttg cttagggcgt ggcagcttcg gataaacgca ggactccgcc tggcagcccg 120

atttctcccg gaacctctgc tcagcctggt gaaccacaca ggccagcgct ctgacatgca 180

gaaggtgacc ctgggcctgc ttgtgttcct ggcaggcttt cctgtcctgg acgccaatga 240

cctagaagat aaaaacagtc ctttctacta tgactggcac agcctccagg ttggcgggct 300

catctgcgct ggggttctgt gcgccatggg catcatcatc gtcatgagtg caaaatgcaa 360

atgcaagttt ggccagaagt ccggtcacca tccaggggag actccacctc tcatcacccc 420

aggctcagcc caaagctgat gaggacagac cagctgaaat tgggtggagg accgttctct 480

gtccccaggt cctgtctctg cacagaaact tgaactccag gatggaattc ttcctcctct 540

gctgggactc ctttgcatgg cagggcctca tctcacctct cgcaagaggg tctctttgtt 600

caatttttt taatctaaaa tgattgtgcc tctgcccaag cagcctggag acttcctatg 660

tgtgcattgg ggtggggctt ggggcaccat gagaaggttg gcgtgccctg gaggctgaca 720

cagaggctgg cactgagcct gcttgttggg aaaagcccac aggcctgttc ccttgtggct 780

tgggacatgg cacaggcccg ccctctgcct cctcagccat gggacctcat atgcaatttg 840

ggatttacta gtagccaaaa ggaatgaaag agagctctaa ccagatggaa cactggaaca 900

ttccagtgga ccctggacca ttccaggaaa actgggacat aggatcgtcc cgctatgatg 960

gaagtgttca gacagtttat aatagtaagc ccctgtgacc ctctcactta ccccgagacc 1020

tcactttatt acaagatctt tccaaatacc caaatatccc tgcaagcccg ttaaataatt 1080

ccctatgcta cccttaataa catacaatga ccacatagtg tgagaacttc caacaagcct 1140

caaagtccct tgagactccc caatacctaa taaggcatgc gaaatgttct catgaactac 1200

cccacaacac gcctaaaact caaaacaccc aaaaatatct cctccaatgt cctgagacat 1260

gaacccaaaa agagacccac aataaactcg tgacttgtcc cctc 1304

<210> 13
<211> 2245
<212> DNA
<213> Homo sapiens

<400> 13
gaatctcgac ccttgaatgg agttacacga acggccagat gaaagaagga aggcccggac 60

ctccactcag ggccgactag gggactggcg gagggtgcac gctgatggat ttactcaccg 120

ggtgcttgga gctccagcag ctggctggag cccgcgatga cgtcacggac tcgggtcaca 180

tggccgagtc cgccccgccc cctccccgtc cccgccgctg cagccgtcgc cttcggagcg 240

aagggtaccg acccggcaga agctcggagc tctcggggta tcgaggaggc aggcccgcgg 300

gcgcacgggc gagcgggccg ggagccggag cggcggagga gccggcagca gcggcgcggc 360

gggctccagg cgaggcggtc gacgctcctg aaaacttgcg cgcgcgctcg cgccactgcg 420

cccggagcga tgaagatggt cgcgccctgg acgcggttct actccaacag ctgctgcttg 480

tgctgccatg tccgcaccgg caccatcctg ctcggcgtct ggtatctgat catcaatgct 540

gtggtactgt tgattttatt gagtgccctg gctgatccgg atcagtataa cttttcaagt 600

tctgaactgg gaggtgactt tgagttcatg gatgatgcca acatgtgcat tgccattgcg 660

atttctcttc tcatgatcct gatatgtgct atggctactt acggagcgta caagcaacgc 720

gcagcctgga tcatcccatt cttctgttac cagatctttg actttgccct gaacatgttg 780

gttgcaatca ctgtgcttat ttatccaaac tccattcagg aatacatacg gcaactgcct 840

cctaattttc cctacagaga tgatgtcatg tcagtgaatc ctacctgttt ggtccttatt 900

attcttctgt ttattagcat tatcttgact tttaagggtt acttgattag ctgtgtttgg 960

aactgctacc gatacatcaa tggtaggaac tcctctgatg tcctggttta tgttaccagc 1020

aatgacacta cggtgctgct acccccgtat gatgatgcca ctgtgaatgg tgctgccaag 1080

gagccaccgc caccttacgt gtctgcctaa gccttcaagt gggcggagct gagggcagca 1140

gcttgacttt gcagacatct gagcaatagt tctgttattt cacttttgcc atgagcctct 1200

ctgagcttgt ttgttgctga aatgctactt tttaaaattt agatgttaga ttgaaaactg 1260

tagttttcaa catatgcttt gctggaacac tgtgatagat taactgtaga attcttcctg 1320

tacgattggg gatataatgg gcttcactaa ccttccctag gcattgaaac ttcccccaaa 1380

tctgatggac ctagaagtct gcttttgtac ctgctgggcc ccaaagttgg gcatttttct 1440

ctctgttccc tctcttttga aaatgtaaaa taaaaccaaa aatagacaac tttttcttca 1500

gccattccag catagagaac aaaaccttat ggaaacagga atgtcaattg tgtaatcatt 1560

gttctaatta ggtaaataga agtccttatg tatgtgttac aagaatttcc cccacaacat 1620

cctttatgac tgaagttcaa tgacagtttg tgtttggtgg taaaggattt tctccatggc 1680

ctgaattaag accattagaa agcaccaggc cgtgggagca gtgaccatct gctgactgtt 1740

cttgtggatc ttgtgtccag ggacatgggg tgacatgcct cgtatgtgtt agagggtgga 1800

atggatgtgt ttggcgctgc atgggatctg gtgcccctct tctcctggat tcacatcccc 1860

acccagggcc cgcttttact aagtgttctg ccctagattg gttcaaggag gtcatccaac 1920

tgactttatc gagtggaatt gggatatatt tgatatactt ctgcctaaca acatggaaaa 1980

gggttttctt ttccctgcaa gctacatcct actgctttga acttccaagt atgtctagtc 2040

acctttaaa atgtaaacat tttcagaaaa atgaggattg ccttccttgt atgcgctttt 2100

taccttgact acctgaattg caagggattt ttatatattc atatgttaca aagtcagcaa 2160

ctctcctgtt ggttcattat tgaatgtgct gtaaattaag ttgtttgcaa ttaaaacaag 2220

gtttgcccac aaaaaaaaaa aaaaa 2245

<210> 14
<211> 623
<212> DNA
<213> Homo sapiens

<400> 14
aggccaagct ggactgcata aagattggta tggccttagc tcttagccaa acaccttcct 60

gacaccatga gggccagcag cttcttgatc gtggtggtgt tcctcatcgc tgggacgctg 120

gttctagagg cagctgtcac gggagttcct gttaaaggtc aagacactgt caaaggccgt 180

gttccattca atggacaaga tcccgttaaa ggacaagttt cagttaaagg tcaagataaa 240

gtcaaagcgc aagagccagt caaaggtcca gtctccacta agcctggctc ctgccccatt 300

atcttgatcc ggtgcgccat gttgaatccc cctaaccgct gcttgaaaga tactgactgc 360

ccaggaatca agaagtgctg tgaaggctct tgcgggatgg cctgtttcgt tccccagtga 420

gagggagccg gtccttgctg cacctgtgcc gtccccagag ctacaggccc catctggtcc 480

taagtccctg ctgcccttcc ccttcccaca ctgtccattc ttcctcccat tcaggatgcc 540

cacggctgga gctgcctctc tcatccactt tccaataaag agttccttct gctccaaaaa 600

aaaaaaaaaa aaaaaaaaaa aaa 623

<210> 15
<211> 1745
<212> DNA
<213> Homo sapiens

<400> 15
gcgcccctgg cagccttcaa cgtcggtccc caggcagcat ggtgaggtct gctcccggac 60

cctcgccacc atgtacgtga gctacctcct ggacaaggac gtgagcatgt accctagctc 120

cgtgcgccac tctggcggcc tcaacctggc gccgcagaac ttcgtcagcc ccccgcagta 180

cccggactac ggcggttacc acgtggcggc cgcagctgca gcgcagaact tggacagcgc 240

gcagtccccg gggccatcct ggccggcagc gtatggcgcc ccactccggg aggactggaa 300

tggctacgcg cccggaggcg cggccgccgc caacgccgtg gctcacgcgc tcaacggtgg 360

ctccccggcc gcagccatgg gctacagcag ccccgcagac taccatccgc accaccaccc 420

gcatcaccac ccgcaccacc cggccgccgc gccttcctgc gcttctgggc tgctgcaaac 480

gctcaacccc ggccctcctg ggcccgccgc caccgctgcc gccgagcagc tgtctcccgg 540

cggccagcgg cggaacctgt gcgagtggat gcggaagccg gcgcagcagt ccctcggcag 600

ccaagtgaaa accaggacga aagacaaata tcgagtggtg tacacggacc accagcggct 660

ggagctggag aaggagtttc actacagtcg ctacatcacc atccggagga aagccgagct 720

agccgccacg ctggggctct ctgagaggca ggttaaaatc tggtttcaga accgcagagc 780

aaaggagagg aaaatcaaca agaagaagtt gcagcagcaa cagcagcagc agccaccaca 840

gccgcctccg ccgccaccac agcctcccca gcctcagcca ggtcctctga gaagtgtccc 900

agagcccttg agtccggtgt cttccctgca agcctcagtg tctggctctg tccctggggt 960

tctggggcca actgggggggg tgctaaaccc caccgtcacc cagtgaccca ccggggtctg 1020

cagcggcaga gcaattccag gctgagccat gaggagcgtg gactctgcta gactcctcag 1080

gagagacccc tcccctccca cccacagcca tagacctaca gacctggctc tcagaggaaa 1140

aatgggagcc aggagtaaga caagtgggat ttggggcctc aagaaatata ctctcccaga 1200

tttttacttt ttccatctgg ctttttctgc cactgaggag acagaaagcc tccgctgggc 1260

ttcattccgg actggcagaa gcattgcctg gactgaccac accaaccagc ttcatctatc 1320

cgactcttct cttcctagat ctgcaggctg cacctctggc tagagccgag gggagagagg 1380

gactcaaggg aaaggcaagc ttgaggccaa gatggctgct gcctgctcat ggccctcgga 1440

ggtccagctg ggcctcctgc ctccgggcag caaggtttac actgcggaac gcaaaggcag 1500

ctaagataga aagctggact gaccaaagac tgcagaaccc ccaggtggcc ctgcgtcttt 1560

tttctcttcc ctttcccaga ccaggaaagg cttggctggt gtatgcacag ggtgtggtat 1620

gaggggggtgg ttattggact ccaggcctga ccaggggggcc cgaacaggac ttgttagaga 1680

gcctgtcacc agagcttctc tgggctgaat gtatgtcagt gctataaatg ccagagccaa 1740

cctgg 1745

<210> 16
<211> 4093
<212> DNA
<213> Homo sapiens

<400> 16
cgcgcgctgc ctgaggacgc cgcggccccc gcccccgcca tgggcgcccc tgcctgcgcc 60

ctcgcgctct gcgtggccgt ggccatcgtg gccggcgcct cctcggagtc cttggggacg 120

gagcagcgcg tcgtggggcg agcggcagaa gtcccgggcc cagagcccgg ccagcaggag 180

cagttggtct tcggcagcgg ggatgctgtg gagctgagct gtcccccgcc cgggggtggt 240

cccatggggc ccactgtctg ggtcaaggat ggcacagggc tggtgccctc ggagcgtgtc 300

ctggtggggc cccagcggct gcaggtgctg aatgcctccc acgaggactc cggggcctac 360

agctgccggc agcggctcac gcagcgcgta ctgtgccact tcagtgtgcg ggtgacagac 420

gctccatcct cgggagatga cgaagacggg gaggacgagg ctgaggacac aggtgtggac 480

acaggggccc cttactggac acggcccgag cggatggaca agaagctgct ggccgtgccg 540

gccgccaaca ccgtccgctt ccgctgccca gccgctggca accccactcc ctccatctcc 600

tggctgaaga acggcaggga gttccgcggc gagcaccgca ttggaggcat caagctgcgg 660

catcagcagt ggagcctggt catggaaagc gtggtgccct cggaccgcgg caactacacc 720

tgcgtcgtgg agaacaagtt tggcagcatc cggcagacgt acacgctgga cgtgctggag 780

cgctccccgc accggcccat cctgcaggcg gggctgccgg ccaaccagac ggcggtgctg 840

ggcagcgacg tggagttcca ctgcaaggtg tacagtgacg cacagcccca catccagtgg 900

ctcaagcacg tggaggtgaa cggcagcaag gtgggcccgg acggcacacc ctacgttacc 960

gtgctcaaga cggcgggcgc taacaccacc gacaaggagc tagaggttct ctccttgcac 1020

aacgtcacct ttgaggacgc cggggagtac acctgcctgg cgggcaattc tattgggttt 1080

tctcatcact ctgcgtggct ggtggtgctg ccagccgagg aggagctggt ggaggctgac 1140

gaggcgggca gtgtgtatgc aggcatcctc agctacgggg tgggcttctt cctgttcatc 1200

ctggtggtgg cggctgtgac gctctgccgc ctgcgcagcc cccccaagaa aggcctgggc 1260

tcccccaccg tgcacaagat ctcccgcttc ccgctcaagc gacaggtgtc cctggagtcc 1320

aacgcgtcca tgagctccaa cacaccactg gtgcgcatcg caaggctgtc ctcaggggag 1380

ggccccacgc tggccaatgt ctccgagctc gagctgcctg ccgaccccaa atgggagctg 1440

tctcgggccc ggctgaccct gggcaagccc cttggggagg gctgcttcgg ccaggtggtc 1500

atggcggagg ccatcggcat tgacaaggac cgggccgcca agcctgtcac cgtagccgtg 1560

aagatgctga aagacgatgc cactgacaag gacctgtcgg acctggtgtc tgagatggag 1620

atgatgaaga tgatcgggaa acacaaaaac atcatcaacc tgctgggcgc ctgcacgcag 1680

ggcgggcccc tgtacgtgct ggtggagtac gcggccaagg gtaacctgcg ggagtttctg 1740

cgggcgcggc ggcccccggg cctggactac tccttcgaca cctgcaagcc gcccgaggag 1800

cagctcacct tcaaggacct ggtgtcctgt gcctaccagg tggcccgggg catggagtac 1860

ttggcctccc agaagtgcat ccacagggac ctggctgccc gcaatgtgct ggtgaccgag 1920

gacaacgtga tgaagatcgc agacttcggg ctggcccggg acgtgcacaa cctcgactac 1980

tacaagaaga caaccaacgg ccggctgccc gtgaagtgga tggcgcctga ggccttgttt 2040

gaccgagtct acactcacca gagtgacgtc tggtcctttg gggtcctgct ctgggagatc 2100

ttcacgctgg ggggctcccc gtaccccggc atccctgtgg aggagctctt caagctgctg 2160

aaggagggcc accgcatgga caagcccgcc aactgcacac acgacctgta catgatcatg 2220

cgggagtgct ggcatgccgc gccctcccag aggcccacct tcaagcagct ggtggaggac 2280

ctggaccgtg tccttaccgt gacgtccacc gacgagtacc tggacctgtc ggcgcctttc 2340

gagcagtact ccccgggtgg ccaggacacc cccagctcca gctcctcagg ggacgactcc 2400

gtgtttgccc acgacctgct gcccccggcc ccacccagca gtgggggctc gcggacgtga 2460

agggccactg gtccccaaca atgtgagggg tccctagcag ccctccctgc tgctggtgca 2520

cagccactcc ccggcatgag actcagtgca gatggagaga cagctacaca gagctttggt 2580

ctgtgtgtgt gtgtgtgcgt gtgtgtgtgt gtgtgcacat ccgcgtgtgc ctgtgtgcgt 2640
gcgcatcttg cctccaggtg cagaggtacc ctgggtgtcc ccgctgctgt gcaacggtct 2700

cctgactggt gctgcagcac cgaggggcct ttgttctggg gggacccagt gcagaatgta 2760

agtgggccca cccggtggga ccccgtgggg cagggagctg ggcccgacat ggctcggcct 2820

ctgcctttgc accacgggac atcacagggt gcgctcggcc cctcccacac ccaaagctga 2880

gcctgcaggg aagccccaca tgtccagcac cttgtgcctg gggtgttagt ggcaccgcct 2940

ccccacctcc aggctttccc acttcccacc ctgcccctca gagactgaaa ttacgggtac 3000

ctgaagatgg gagcctttac cttttatgca aaaggtttat tccggaaact agtgtacatt 3060

tctataaata gatgctgtgt atatggtata tatacatata tatatataac atatatggaa 3120

gaggaaaagg ctggtacaac ggaggcctgc gaccctgggg gcacaggagg caggcatggc 3180

cctgggcggg gcgtgggggg gcgtggaggg aggccccagg ggtctcaccc atgcaagcag 3240

aggaccaggg ctttttctgg caccgcagtt ttgttttaaa actggacctg tatatttgta 3300

aagctattta tgggcccctg gcactcttgt tcccacaccc caacacttcc agcatttagc 3360

tggccacatg gcggagagtt ttaattttta acttattgac aaccgagaag gtttatcccg 3420

ccgatagagg gacggccaag aatgtacgtc cagcctgccc cggagctgga ggatcccctc 3480

caagcctaaa aggttgttaa tagttggagg tgattccagt gaagatattt tatttgcttt 3540

gtccttttte aggagaatta gatttctata ggatttttct ttaggagatt tatttttgg 3600

acttcaaagc aagctggtat tttcatacaa attcttctaa ttgctgtgtg tcccaggcag 3660

ggagacggtt tccagggagg ggccggccct gtgtgcaggt tccgatgtta ttagatgtta 3720

caagtttata tatatctata tatataattt attgagtttt tacaagatgt atttgttgta 3780

gacttaacac ttcttacgca atgcttctag agttttatag cctggactgc tacctttcaa 3840

agcttggagg gaagccgtga attcagttgg ttcgttctgt actgttactg ggccctgagt 3900

ctgggcagct gtcccttgct tgcctgcagg gccatggctc agggtggtct cttcttgggg 3960

cccagtgcat ggtggccaga ggtgtcaccc aaaccggcag gtgcgatttt gttaacccag 4020

cgacgaactt tccgaaaaat aaagacacct ggttgctaac ctgaaaaaaa aaaaaaaaaa 4080

aaaaaaaaaa aaa 4093

<210> 17
<211> 719
<212> DNA
<213> Homo sapiens

<400> 17
ttttttttttt ttttttttttc aagatggcag ctttaatcac attggccaag ggccctaggt 60

tccctctgtt caggcccact tagccacaca cccaccctgg ccatatccag aacacttcta 120

ccaggtgggc cctgccctgt ggccactgat gtgggaacct gaggtcacat cagtctgtgg 180

actcctgggt taggtgaccc ttctgccttg aggtctgctg gacacctggg catgggatcc 240

agtagtcctg agctcactct tttggccatc tccagctgct cctaggggac gtggctcagg 300

cccgctcctg gggcaggggg ttggcggtgg catgaggtgg gttggggagg aggacgtgtc 360

tccacattgc agctggcttc ctcctgggct gaacctcctt gtgctttgag actgacagga 420

agagcagagt tgcttcaggt agaggctcgg cccaggccct tggggcagga taacagcaga 480

gaactcaggt gcctcctggc acagacagga ggacagatgg cacaggtgag catccacaca 540

ctccattgcc acaggggtta tggcatggcc catgacccat caaagcttcc aggtcgggat 600

acaggagagg gcctcagaag aggggacca agccctaggc cccatacttc ccagagggag 660

ccccaggcct gcaggggcat ctgaaaggat ggagtcctgg cccagctggg cctcagggg 719

<210> 18
<211> 3503
<212> DNA
<213> Homo sapiens

<400> 18
ggccgggagc tcgggagtcg gccgccgcgc cgaggttcgc cccgttttgc agagagagcc 60

gagtcgggac ctggaaagac gtccccgcgg ggctccggcc gccgcgcctc cccgccggcg 120

cctgccctgc cctgcccgtc ccagccccgc ggttcggggc gtgcggccgg gacgcgcgga 180

gccccggccc tgacccgctg cgccgggacg ggacgctcct aacgccgccg taccggtccg 240

tggttgcagg gtcgctccgc gcctttccgt cagtgagggt cggaacccca gctccagggc 300

tagcgcagtg tggccccagg ccctcgcctc cggtgcacgg gaccccggac ccccccaagc 360

ctctggcttc acgagacccc aaccttcagt tggaacagct tggaacagcg cgagcgcccg 420

ggaagccctg gccgggtcgt gcgctccgtg aggggtccta ggcgggcagg acagtcggac 480

cgaaccgccg ggctggtgcc gcgagcccag gctgtcacct tcgtcccgcc tcaggcgagg 540

ggttcagcgc ctgccccgaa gataacacag gggtcccctt ctgtcccggc ggcccgcgag 600

agccaaggct gcagctctcc cagtgaagtg atatcactgc ctctgtggac aagacacctc 660

caggagccca gctcacagcc accggtacct tcttccagga caagctgggg gcctccatgg 720

gcgcctgagg gccaggcgcc agggccgtgg gcacgagtat ggtgagacac cagcccctgc 780

agtactacga gccacagctg tgcctctcct gcctcacggg catctacggc tgccgttgga 840

agcgctacca gcgctcccat gatgatacca caccgtggga gcgcctctgg ttcctgctcc 900

tcaccttcac ctttggcctc acgctcacct ggctttactt ctggtgggaa gtccacaatg 960

actatgatga attcaactgg tacctctaca accgcatggg ctactggagc gactggcccg 1020

tacccatcct tgtgaccaca gctgctgcct tcgcatacat cgctggcctc ctggtcctgg 1080

cactatgtca cattgccgtg gggcagcaga tgaacctgca ctggctgcac aagatcgggc 1140

tggtggtcat cctggcttcc acggtggtgg ccatgtcggc cgtggcccag ctgtgggagg 1200

acgagtggga ggtgctgctg atctccctgc agggcacagc gccattcctg catgtggggg 1260

ctgtggcagc agtcaccatg ctctcctgga tcgtggcagg acagttcgcc cgtgcagagc 1320

ggacctcctc ccaggtgacc attctctgta ccttcttcac cgtggtgttt gccctctacc 1380

tggcccctct caccatctcc tctccctgca tcatggagaa gaaagacctc ggccccaagc 1440

ctgctctcat tggccaccgc ggggccccca tgctggctcc agagcacacg ctcatgtcct 1500

tccggaaggc cctcgagcag aagctgtacg ggctccaggc tgacattacc atcagcctgg 1560

acggcgtgcc cttcctcatg catgacacca ccctgcggcg caccaccaac gtggaggagg 1620

agttcccgga gctggcccgc aggcctgcct ccatgcttaa ctggaccacc ctgcagagac 1680

tcaacgctgg ccagtggttc ctgaagactg acccccttctg gacagccagc tccctgtcac 1740

cctccgacca cagagaggcc cagaaccagt ccatctgcag cctggcagag ctcctggagc 1800

tggccaaggg caatgccaca ctgctgctca acctgcgtga cccgccccgg gagcaccccct 1860

accgcagcag ttttatcaac gtgactctgg aggccgtgct gcactccggc ttcccccagc 1920

accaggtcat gtggctgcct agcaggcaga ggcccctggt gcggaaggtg gctcccggct 1980

tccaacagac atcaggctcc aaggaggcag tcgccagcct gcggagaggc cacatccagc 2040

ggctgaacct gcgctacact caggtgtccc gccaggagct cagggactac gcgtcctgga 2100

acctgagtgt gaacctctac acagtcaacg caccgtggct cttctccctg ctgtggtgtg 2160

cgggggtccc atccgtcacc tctgacaact cccacaccct gtcccaggtg ccttcccccc 2220

tctggatcat gcccccggac gagtactgtc tcatgtgggt cactgccgac ctggtctcct 2280

tcaccctcat cgtgggcatc ttcgtgctcc agaagtggcg cctgggtggc atacggagct 2340

acaaccctga gcagatcatg ctgagtgctg cggtgcgccg gaccagccgg gacgtcagca 2400

tcatgaagga gaagcttatt ttctcagaga tcagcgatgg tgtagaggtc tccgatgtgc 2460

tctccgtatg ttcagacaac agttatgaca catatgccaa cagcaccgcc acccctgtgg 2520

gcccccgagg gggtggcagc cacaccaaga ccctcataga gcggagtggg cgttagctga 2580

agacatgtct gtcccacctg tacctgacac agaagctggg gagcctagga gagctggtgg 2640

aagtgtgtct gaactcggag tgctctggga gcgggctcca cagcctcctt gtgggctcca 2700

gcccttgtc agccgcagcc tctcttgagg gggactccct gtctcctgag gcccagctgg 2760

gccaggactc catcctttca gatgcccctg caggcctggg gctccttctg ggaagtatgg 2820

ggcctagggc ttggtccccc tcttctgagg ccctctcctg tatcccgacc tggaagcttt 2880

gatgggtcat gggccatgcc atacccccctg tggcaatgga gtgtgtggat gctcacctgt 2940

gccatctgtc ctcctgtctg tgccaggagg cacctgagtt ctctgctgtt atcctgcccc 3000

aagggcctgg gccgagcctc tacctgaagc aactctgctc ttcctgtcag tctcaaagca 3060

caaggaggtt cagcccagga ggaagccagc tgcaatgtgg agacacgtcc tcctccccaa 3120

cccacctcat gccaccgcca acccctgcc ccaggagcgg gcctgagcca cgtcccctag 3180

gagcagctgg agatggccaa aagagtgagc tcaggactac tggatcccat gcccaggtgt 3240

ccagcagacc tcaaggcaga agggtcacct aacccaggag tccacagact gatgtgacct 3300

caggttccca catcagtggc cacagggcag ggcccacctg gtagaagtgt tctggatatg 3360

gccagggtgg gtgtgtggct aagtgggcct gaacagaggg aacctagggc ccttggcaat 3420

gtgatttaaa gctgccatct tgcggaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 3480

aaaaaaaaaa aaaaaaaaaa aaa 3503

<210> 19
<211> 2309
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (2255)..(2256)
<223> n is a, c, g, or t

<400> 19
tttgtcttca agagtttttc gagaccaggg aagaaggaag gaaatgccca gtttgatcgt 60

gggagtggta aaatgataaa gtagatctgg gtggggtttg tagcaccaga gcataatgga 120

gaaacacctt ggttttgtaa tcaagactgg atctaccagt gacttgctga ataacttcgg 180

tgattccttt ctcttcttgg gtctcactgt atttcaaaac atgaagaatt tcattgtaat 240

gttacctaat aagtgagcca gcacttctac tctgtgagaa agtaggaaaa ctcttgggac 300

aatcagagat gatgtgatgt aatgtccatt agttcttcct gtgaataatc ctgagggaaa 360

gcccccaggt ccctcccaga atggggtgga tatttcccaa tacagctaag gaattatccc 420

ttgtaaatac cacagacccg ccctggagcc aggccaagct ggactgcata aagattggta 480

tggccttagc tcttagccaa acaccttcct gacaccatga gggccagcag cttcttgatc 540

gtggtggtgt tcctcatcgc tgggacgctg gttctagagg cagctgtcac gggaggtgag 600

tgaacaggtg acctgctggg ctgggttgga ctaaggggag accctctgga caccctgggc 660

caggacaggg agcactactg aagcagtagg cagcactgga gcccagattt cagctttctg 720

ttctttgcca tcatattcag aaaaaatagg actttggctg gtggactcca cgtgctttcc 780

acctcagtga ctgagatatc aggactgttt gtggaagtaa tgttggtatg tggccttggc 840

ctcagatgtc aatacctgtg cagaatgtgc aataaaataa tgaactccag gattttaaac 900

cttgggtgtg gacacagtcc ccgtttctct gccccataaa agcactggag taatcagtac 960

tctaaaagga ggttaagaaa caacaagcct tcaggaatca tgttgtttga ggacccccat 1020

tttataagga gggaaccaaa aatgtagaaa tgagtgagca attgccaagg taattcccag 1080

agccaggatg gggctcaagt ctcctagtat gtggctcagg gttctttcct actccaatgc 1140

acttcctaac aaatgacaat gtgtcctctt cactgctggg tgtcacccca gtctgaccac 1200

tgctcctgag agacttggag tggaggaagg gggaagaaac aaatactcaa gggaactctg 1260

gtcctgtaga ccaccccaaa aaaggaagag ccttccaaga gtgtagctcc cagaggtgta 1320

ccttccctac tcaggccatg gtttgaggat gctgcagtaa gcagtggatg gacccagacc 1380

cagaggaaag acatggcagc tgaagcagag gcttactggg tataaatgtg ggctcgtttc 1440

ttcttttaac agttcctgtt aaaggtcaag acactgtcaa aggccgtgtt ccattcaatg 1500

gacaagatcc cgttaaagga caagtttcag ttaaaggtca agataaagtc aaagcgcaag 1560

agccagtcaa aggtccagtc tccactaagc ctggctcctg ccccattatc ttgatccggt 1620

gcgccatgtt gaatcccccc aaccgctgct tgaaagatac tgactgccca ggaatcaaga 1680

agtgctgtga aggctcttgc gggatggcct gtttcgttcc ccagtgaggt gagcactagc 1740

tggagaacga ggagacccct gaagacacaa aagaaggctg agcggtgggg aagcatccca 1800

ggttggtggg agggaggttg tgggaggtga cagaaagact gggagactga ggggtctgag 1860

aggctataac cagagtgcct agaaggatga tctgtcttcc tcactgcctc tgagtgcttt 1920

gatgtgctga ctctcacctc tgatactctt ctcttccaca gagggagccg gtccttgctg 1980

cacctgtgcc gtccccagag ctacaggccc catctggtcc taagtccctg ctgcccttcc 2040

ccttcccaca ctgtccattc ttcctcccat tcaggatgcc cacggctgga gctgcctctc 2100

tcatccactt tccaataaag acttccttct gctccacttg tttctggttc ctatgacttc 2160

tgggctcctg gatgctttgg ggaaatggat gtagaattgg gacttcttct ctccagtgaa 2220

gaggggaaac ggtcccatgg tgaaagagag caggnnggag gaaacaagga ggcacatgct 2280

agggcttcat attacaatcc aataatcag 2309

<210> 20
<211> 6287
<212> DNA
<213> Homo sapiens

<400> 20
ggcagctccg agggcacctc cggttctccc ccatcctccg ggagtgtctg ggcgctcagt 60

ccgctctgat cccgccgaaa ccacctgcgg ttggcaggca ggagactagg cgtctgccgg 120

ggagggcagg gacccgctaa gctgatctcc tgtacagtag tgctacttaa aatatgctgg 180

ggaccatcac catcacagtt ggacagagag actctgaaga tgtgagcaaa agagactccg 240

ataaagagat ggctactaag tcagcggttg ttcacgacat cacagatgat gggcaggagg 300

agacacccga aataatcgaa cagattcctt cttcagaaag caatttagaa gagctaacac 360

aacccactga gtcccaggct aatgatattg gatttaagaa ggtgtttaag tttgttggct 420

ttaaattcac tgtgaaaaag gataagacag agaagcctga cactgtccag ctactcactg 480

tgaagaaaga tgaaggggag ggagcagcag gggctggcga ccacaaggac cccagccttg 540

gggctggaga agcagcatcc aaagaaagcg aacccaaaca atctacagag aaacccgaag 600

agaccctgaa gcgtgagcaa agccacgcag aaatttctcc cccagccgaa tctggccaag 660

cagtggagga atgcaaagag gaaggagaag agaaacaaga aaaagaacct agcaagtctg 720

cagaatctcc gactagtccc gtgaccagtg aaacaggatc aaccttcaaa aaattcttca 780

ctcaaggttg ggccggctgg cgcaaaaaga ccagtttcag gaagccgaag gaggatgaag 840

tggaagcttc agagaagaaa aaggaacaag agccagaaaa agtagacaca gaagaagacg 900

gaaaggcaga ggttgcctcc gagaaactga ccgcctccga gcaagcccac ccacaggagc 960

cggcagaaag tgcccacgag ccccggttat cagctgaata tgagaaagtt gagctgccct 1020

cagaggagca agtcagtggc tcgcagggac cttctgaaga gaaacctgct ccgttggcga 1080

cagaagtgtt tgatgagaaa atagaagtcc accaagaaga ggttgtggcc gaagtccacg 1140

tcagcaccgt ggaggagaga accgaagagc agaaaacgga ggtggaagaa acagcagggt 1200

ctgtgccagc tgaagaattg gttgaaatgg atgcagaacc tcaggaagct gaacctgcca 1260

aggagctggt gaagctcaaa gaaacgtgtg tttccggaga ggaccctaca cagggagctg 1320

acctcagtcc tgatgagaag gtgctgtcca aacccccga aggcgttgtg agtgaggtgg 1380

aaatgctgtc atcacaggag agaatgaagg tgcagggaag tccactaaag aagcttttta 1440

ccagcactgg cttaaaaaag ctttctggaa agaaacagaa agggaaaaga ggaggaggag 1500

acgaggaatc aggggagcac actcaggttc cagccgattc tccggacagc caggaggagc 1560

aaaagggcga gagctctgcc tcatcccctg aggagcccga ggagatcacg tgtctggaaa 1620

agggcttagc cgaggtgcag caggatgggg aagctgaaga aggagctact tccgatggag 1680

agaaaaaaag agaaggtgtc actccctggg catcattcaa aaagatggtg acgcccaaga 1740

agcgtgttag acggccttcg gaaagtgata aagaagatga gctggacaag gtcaagagcg 1800

ctaccttgtc ttccaccgag agcacagcct ctgaaatgca agaagaaatg aaagggagcg 1860

tggaagagcc aaagccggaa gaaccaaagc gcaaggtgga tacctcagta tcttgggaag 1920

ctttaatttg tgtgggatca tccaagaaaa gagcaaggag agggtcctct tctgatgagg 1980

aaggggacc aaaagcaatg ggaggagacc accagaaagc tgatgaggcc ggaaaagaca 2040

aagagacggg gacagacggg atccttgctg gttcccaaga acatgatcca gggcagggaa 2100

gttcctcccc ggagcaagct ggaagcccta ccgaagggga gggcgtttcc acctgggagt 2160

catttaaaag gttagtcacg ccaagaaaaa aatcaaagtc caagctggaa gagaaaagcg 2220

aagactccat agctgggtct ggtgtagaac attccactcc agacactgaa cccggtaaag 2280

aagaatcctg ggtctcaatc aagaagttta ttcctggacg aaggaagaaa aggccagatg 2340

ggaaacaaga acaagcccct gttgaagacg cagggccaac aggggccaac gaagatgact 2400

ctgatgtccc ggccgtggtc cctctgtctg agtatgatgc tgtagaaagg gagaaaatgg 2460

aggcacagca agcccaaaaa agcgcagagc agcccgagca gaaggcagcc actgaggtgt 2520

ccaaggagct cagcgagagt caggttcata tgatggcagc agctgtcgct gacgggacga 2580

gggcagctac cattattgaa gaaaggtctc cttcttggat atctgcttca gtgacagaac 2640

ctcttgaaca agtagaagct gaagccgcac tgttaactga ggaggtattg gaaagagaag 2700

taattgcaga agaagaaccc cccacggtta ctgaacctct gccagagaac agagaggccc 2760

ggggcgacac ggtcgttagt gaggcggaat tgaccccga agctgtgaca gctgcagaaa 2820

ctgcagggcc attgggtgcc gaagaaggaa ccgaagcatc tgctgctgaa gagaccacag 2880

aaatggtgtc agcagtctcc cagttaaccg actccccaga caccacagag gaggccactc 2940

cggtgcagga ggtggaaggt ggcgtacctg acatagaaga gcaagagagg cggactcaag 3000

aggtcctcca ggcagtggca gaaaaagtga aagaggaatc ccagctgcct ggcaccggtg 3060

ggccagaaga tgtgcttcag cctgtgcaga gagcagaggc agaaagacca gaagagcagg 3120

ctgaagcgtc gggtctgaag aaagagacgg atgtagtgtt gaaagtagat gctcaggagg 3180

caaaaactga gccttttaca caagggaagg tggtggggca gaccacccca gaaagctttg 3240

aaaaagctcc tcaagtcaca gagagcatag agtccagtga gcttgtaacc acttgtcaag 3300

ccgaaacctt agctggggta aaatcacagg agatggtgat ggaacaggct atccccctg 3360

actcggtgga aacccctaca gacagtgaga ctgatggaag caccccgta gccgactttg 3420

acgcaccagg cacaacccag aaagacgaga ttgtggaaat ccatgaggag aatgaggtcg 3480

catctggtac ccagtcaggg ggcacagaag cagaggcagt tcctgcacag aaagagaggc 3540

ctccagcacc ttccagtttt gtgttccagg aagaaactaa agaacaatca aagatggaag 3600

acactctaga gcatacagat aaagaggtgt cagtggaaac tgtatccatt ctgtcaaaga 3660

ctgaggggac tcaagaggct gaccagtatg ctgatgagaa aaccaaagac gtaccatttt 3720

tcgaaggact tgaggggtct atagacacag gcataacagt cagtcgggaa aaggtcactg 3780

aagttgccct taaaggtgaa gggacagaag aagctgaatg taaaaaggat gatgctcttg 3840

aactgcagag tcacgctaag tctcctccat cccccgtgga gagagagatg gtagttcaag 3900

tcgaaaggga gaaaacagaa gcagagccaa cccatgtgaa tgaagagaag cttgagcacg 3960

aaacagctgt taccgtatct gaagaggtca gtaagcagct cctccagaca gtgaatgtgc 4020

ccatcataga tggagcaaag gaagtcagca gtttggaagg aagccctcct ccctgcctag 4080

gtcaagagga ggcagtatgc accaaaattc aagttcagag ctctgaggca tcattcactc 4140

taacagcggc tgcagaggag gaaaaggtct taggagaaac tgccaacatt ttagaaacag 4200

gtgaaacgtt ggagcctgca ggtgcacatt tagttctgga agagaaatcc tctgaaaaaa 4260

atgaagactt tgccgctcat ccaggggaag atgctgtgcc cacagggccc gactgtcagg 4320

caaaatcgac accagtgata gtatctgcta ctaccaagaa aggcttaagt tccgacctgg 4380

aaggagagaa aaccacatca ctgaagtgga agtcagatga agtcgatgag caggttgctt 4440

gccaggaggt caaagtgagt gtagcaattg aggatttaga gcctgaaaat gggattttgg 4500

aacttgagac caaaagcagt aaacttgtcc aaaacatcat ccagacagcc gttgaccagt 4560

ttgtacgtac agaagaaaca gccaccgaaa tgttgacgtc tgagttacag acacaagctc 4620

acgtgataaa agctgacagc caggacgctg gacaggaaac ggagaaagaa ggagaggaac 4680

ctctggcctc tgcacaggat gaaacaccaa ttacttcagc caaagaggag tcagagtcaa 4740

ccgcagtggg acaagcacat tctgatattt ccaaagacat gagtgaagcc tcagaaaaga 4800

ccatgactgt tgaggtagaa ggttccactg taaatgatca gcagctggaa gaggtcgtcc 4860

tcccatctga ggaagaggga ggtggagctg gaacaaagtc tgtgccagaa gatgatggtc 4920

atgccttgtt agcagaaaga atagagaagt cactagttga accgaaagaa gatgaaaaag 4980

gtgatgatgt tgatgaccct gaaaaccaga actcagccct ggctgatact gatgcctcag 5040

gaggcttaac caaagagtcc ccagatacaa atggaccaaa acaaaaagag aaggaggatg 5100

cccaggaagt agaattgcag gaaggaaaag tgcacagtga atcagataaa gcgatcacac 5160

cccaagcaca ggaggagtta cagaaacaag agagagaatc tgcaaagtca gaacttacag 5220

aatcttaaaa catcatgcag ttaaactcat tgtctgtttg gaagaccaga atgtgaagac 5280

aagtagtaga agaaaatgaa tgctgctgct gagactgaag accagtattt cagaactttg 5340

agaattggag agcaggcaca tcaactgatc tcatttctag agagcccctg acaatcctga 5400

ggcttcatca ggagctagag ccatttaaca tttcctcttt ccaagaccaa cctacaattt 5460

tcccttgata accatataaa ttctgattta aggtcctaaa ttcttaacct ggaactggag 5520

ttggcaatac ctagttctgc ttctgaaact ggagtatcat tctttacata tttatatgta 5580

tgttttaagt agtcctcctg tatctattgt atatttttt cttaatgttt aaggaaatgt 5640

gcaggatact acatgctttt tgtatcacac agtatatgat ggggcatgtg ccatagtgca 5700

ggcttgggga gctttaagcc tcagttatat aacccacgaa aaacagagcc tcctagatgt 5760

aacattcctg atcaaggtac aattctttaa aattcactaa tgattgaggt ccatatttag 5820

tggtactctg aaattggtca ctttcctatt acacggagtg tgctaaaact aaaaagcatt 5880

ttgaaacata cagaatgttc tattgtcatt gggaaatttt tctttctaac ccagtggagg 5940

ttagaaagaa gttatattct ggtagcaaat taactttaca tccttttcc tacttgttat 6000

ggttgtttgg accgataagt gtgcttaatc ctgaggcaaa gtagtgaata tgttttatat 6060

gttatgaaga aaagaattgt tgtaagtttt tgattctact cttatatgct ggactgcatt 6120

cacacatggc atgaaataag tcaggttctt tacaaatggt attttgatag atactggatt 6180

gtgtttgtgc catatttgtg ccattctttt aagaacaatg ttgcaacaca ttcatttgga 6240

taagttgtga tttgacgact gatttaaata aaatatttgc ttcactt 6287

<210> 21
<211> 6928
<212> DNA
<213> Homo sapiens

<400> 21
ggcgggagcg cgtgcgcccg aggacccggc cggaaggctt gcgccagctc aggatgagga 60

caggctgggc gacccctcgc cgcccggcgg ggctcctcat gctgctcttc tggttcttcg 120

atctcgcgga gccctctggc cgcgcagcta atgacccctt caccatcgtc catggaaata 180

cgggcaagtg catcaagcca gtgtatggct ggatagtagc agacgactgt gatgaaactg 240

aggacaagtt atggaagtgg gtgtcccagc atcggctctt tcatttgcac tcccaaaagt 300

gccttggcct cgatattacc aaatcggtaa atgagctgag aatgttcagc tgtgactcca 360

gtgccatgct gtggtggaaa tgtgagcacc actctctgta cggagctgcc cggtaccggc 420

tggctctgaa ggatggacat ggcacagcaa tctcaaatgc atctgatgtc tggaagaaag 480

gaggctcaga ggaaagcctt tgtgaccagc cttatcatga gatctatacc agagatggga 540

actcttatgg gagaccttgt gaatttccat tcttaattga tgggacctgg catcatgatt 600

gcattcttga tgaagatcat agtgggccat ggtgtgccac caccttaaat tatgaatatg 660

accgaaagtg gggcatctgc ttaaagcctg aaaacggttg tgaagataat tgggaaaaga 720

acgagcagtt tggaagttgc taccaattta atactcagac ggctctttct tggaaagaag 780

cttatgtttc atgtcagaat caaggagctg atttactgag catcaacagt gctgctgaat 840

taacttacct taaagaaaaa gaaggcattg ctaagatttt ctggattggt ttaaatcagc 900

tatactctgc tagaggctgg gaatggtcag accacaaacc attaaacttt ctcaactggg 960

atccagacag gcccagtgca cctactatag gtggctccag ctgtgcaaga atggatgctg 1020

agtctggtct gtggcagagc ttttcctgtg aagctcaact gccctatgtc tgcaggaaac 1080

cattaaataa tacagtggag ttaacagatg tctggacata ctcagatacc cgctgtgatg 1140

caggctggct gccaaataat ggattttgct atctgctggt aaatgaaagt aattcctggg 1200

ataaggcaca tgcgaaatgc aaagccttca gtagtgacct aatcagcatt cattctctag 1260

cagatgtgga ggtggttgtc acaaaactcc ataatgagga tatcaaagaa gaagtgtgga 1320

taggccttaa gaacataaac ataccaactt tatttcagtg gtcagatggt actgaagtta 1380

ctctaacata ttgggatgag aatgagccaa atgttcccta caataagacg cccaactgtg 1440

tttcctactt aggagagcta ggtcagtgga aagtccaatc atgtgaggag aaactaaaat 1500

atgtatgcaa gagaaaggga gaaaaactga atgacgcaag ttctgataag atgtgtcctc 1560

cagatgaggg ctggaagaga catggagaaa cctgttacaa gatttatgag gatgaggtcc 1620

cttttggaac aaactgcaat ctgactatca ctagcagatt tgagcaagaa tacctaaatg 1680

atttgatgaa aaagtatgat aaatctctaa gaaaatactt ctggactggc ctgagagatg 1740

tagattcttg tggagagtat aactgggcaa ctgttggtgg aagaaggcgg gctgtaacct 1800

tttccaactg gaattttctt gagccagctt ccccgggcgg ctgcgtggct atgtctactg 1860

gaaagtctgt tggaaagtgg gaggtgaagg actgcagaag cttcaaagca ctttcaattt 1920

gcaagaaaat gagtggaccc cttgggcctg aagaagcatc ccctaagcct gatgacccct 1980

gtcctgaagg ctggcagagt ttccccgcaa gtctttcttg ttataaggta ttccatgcag 2040

aaagaattgt aagaaagagg aactgggaag aagctgaacg attctgccaa gcccttggag 2100

cacacctttc tagcttcagc catgtggatg aaataaagga atttcttcac tttttaacgg 2160

accagttcag tggccagcat tggctgtgga ttggtttgaa taaaaggagc ccagatttac 2220

aaggatcctg gcaatggagt gatcgtacac cagtgtctac tattatcatg ccaaatgagt 2280

ttcagcagga ttatgacatc agagactgtg ctgctgtcaa ggtatttcat aggccatggc 2340

gaagaggctg gcatttctat gatgatagag aatttattta tttgaggcct tttgcttgtg 2400

atacaaaact tgaatgggtg tgccaaattc caaaaggccg tactccaaaa acaccagact 2460

ggtacaatcc agaccgtgct ggaattcatg gacctccact tataattgaa ggaagtgaat 2520

attggtttgt tgctgatctt cacctaaact atgaagaagc cgtcctgtac tgtgccagca 2580

atcacagctt tcttgcgact ataacatctt ttgtgggact aaaagccatc aaaaacaaaa 2640

tagcaaatat atctggtgat ggacagaagt ggtggataag aattagcgag tggccaatag 2700

atgatcattt tacatactca cgatatccat ggcaccgctt tcctgtgaca tttggagagg 2760

aatgcttgta catgtctgcc aagacttggc ttatcgactt aggtaaacca acagactgta 2820

gtaccaagtt gcccttcatc tgtgaaaaat ataatgtttc ttcgttagag aaatacagcc 2880

cagattctgc agctaaagtg caatgttctg agcaatggat tccttttcag aataagtgtt 2940

ttctaaagat caaacccgtg tctctcacat tttctcaagc aagcgatacc tgtcactcct 3000

atggtggcac ccttccttca gtgttgagcc agattgaaca agactttatt acatccttgc 3060

ttccggatat ggaagctact ttatggattg gtttgcgctg gactgcctat gaaaagataa 3120

acaaatggac agataacaga gagctgacgt acagtaactt tcacccatta ttggttagtg 3180

ggaggctgag aataccagaa aatttttttg aggaagagtc tcgctaccac tgtgccctaa 3240

tactcaacct ccaaaaatca ccgtttactg ggacgtggaa ttttacatcc tgcagtgaac 3300

gccactttgt gtctctctgt cagaaatatt cagaagttaa aagcagacag acgttgcaga 3360

atgcttcaga aactgtaaag tatctaaata atctgtacaa aataatccca aagactctga 3420

cttggcacag tgctaaaagg gagtgtctga aaagtaacat gcagctggtg agcatcacgg 3480

acccttacca gcaggcattc ctcagtgtgc aggcgctcct tcacaactct tccttatgga 3540

tcggactctt cagtcaagat gatgaactca actttggttg gtcagatggg aaacgtcttc 3600

attttagtcg ctgggctgaa actaatgggc aactcgaaga ctgtgtagta ttagacactg 3660

atggattctg gaaaacagtt gattgcaatg acaatcaacc aggtgctatt tgctactatt 3720

caggaaatga gactgaaaaa gaggtcaaac cagttgacag tgttaaatgt ccatctcctg 3780

ttctaaatac tccgtggata ccatttcaga actgttgcta caatttcata ataacaaaga 3840

ataggcatat ggcaacaaca caggatgaag ttcatactaa atgccagaaa ctgaatccaa 3900

aatcacatat tctgagtatt cgagatgaaa aggagaataa ctttgttctt gagcaactgc 3960

tgtacttcaa ttatatggct tcatgggtca tgttaggaat aacttataga aataattctc 4020

ttatgtggtt tgataagacc ccactgtcat atacacattg gagagcagga agaccaacta 4080

taaaaaatga gaagtttttg gctggtttaa gtactgacgg cttctgggat attcaaacct 4140

ttaaagttat tgaagaagca gtttattttc accagcacag cattcttgct tgtaaaattg 4200

aaatggttga ctacaaagaa gaacataata ctacactgcc acagtttatg ccatatgaag 4260

atggtattta cagtgttatt caaaaaaagg taacatggta tgaagcatta aacatgtgtt 4320

ctcaaagtgg aggtcacttg gcaagcgttc acaaccaaaa tggccagctc tttctggaag 4380

atattgtaaa acgtgatgga tttccactat gggttgggct ctcaagtcat gatggaagtg 4440

aatcaagttt tgaatggtct gatggtagta catttgacta tatcccatgg aaaggccaaa 4500

catctcctgg aaattgtgtt ctcttggatc caaaaggaac ttggaaacat gaaaaatgca 4560

actctgttaa ggatggtgct atttgttata aacctacaaa atctaaaaag ctgtcccgtc 4620

ttacatattc atcaagatgt ccagcagcaa aagagaatgg gtcacggtgg atccagtaca 4680

agggtcactg ttacaagtct gatcaggcat tgcacagttt ttcagaggcc aaaaaattgt 4740

gttcaaaaca tgatcactct gcaactatcg tttccataaa agatgaagat gagaataaat 4800

ttgtgagcag actgatgagg gaaaataata acattaccat gagagtttgg cttggattat 4860

ctcaacattc tgttgaccag tcttggagtt ggttagatgg atcagaagtg acatttgtca 4920

aatgggaaaa taaaagtaag agtggtgttg gaagatgtag catgttgata gcttcaaatg 4980

aaacttggaa aaaagttgaa tgtgaacatg gttttggaag agttgtctgc aaagtgcctc 5040

tgggccctga ttacacagca atagctatca tagttgccac actaagtatc ttagttctca 5100

tgggcggact gatttggttc ctcttccaaa ggcaccgttt gcacctggcg ggtttctcat 5160

cagttcgata tgcacaagga gtgaatgaag atgagattat gcttccttct ttccatgact 5220

aaattcttct aaaagttttc taatttgcac taatgtggtt atggagaaat tagtcactta 5280

aaatgtccca gtgtcagtat ttactctgct ccaaagtaga actcttaaat actttttcag 5340

ttgtttagat cttaggcatg tgctggtatc cacagttaat tccctgctaa atgccatgtt 5400

tatcacccta attaatagaa tggaggggac tccaaagctg gaactgaagt ccaaattgtt 5460

tgtacagtaa tatgtttaat gttcattttc tctgtatgaa tgtgattggt aactaggata 5520

tgtatatttt aatagaattt ttaacaaaac ttcttagaaa attaaaatag gcatattact 5580

aggtgacatg tctacttttt aatttttaag agcatccggc caaatgcaaa attagtacct 5640

caaagtaaaa attgaactgt aaactctatc agcattgttt caaaatagtc atttttagca 5700

ctggggaaaa ataaacaata agacatgctt actttttaat ttttattttt ttgagactga 5760

gtctctctct gttgcccagg ctggagtaca atggcgtgat ctcggctcac tgcaaatctc 5820

cgcctcccag gttcaagcga ttctcctgcc tcagcctcct gagtagctgg gattacaggc 5880

aactgccacc atgcccggct aatttttgta tttttagtag agatggggtt tcaccatgtt 5940

ggccaggctg gtctcgaact cgtgaccgca gtgatcctcc cgcctcggcc tcccaaagtg 6000

ctgggattac aggcatgagc caccgcgcct ggcctctgct tacttttttat atagcaaaat 6060

gattcccctt ggcaagatgt ttcttatatt attccaaagt tatttcatac cattattatg 6120

taaatatgaa gagtttttt ctgtttataa ttgtttataa aacaatgact tttaaagatt 6180

tagtgcttaa cattttccca agtgtgggaa cattattttt agattgagta ggtaccttgt 6240

agcagtgtgc tttgcatttt ctgatgtatt acatgactgt ttcttttgta aagagaatca 6300

actaggtatt taagactgat aattttacaa tttatatgct tcacatagca tgtcaacttt 6360

tgactaagaa ttttgtttta ctttttaac atgtgttaaa cagagaaagg gtccatgaag 6420

gaaagtgtat gagttgcatt tgtaaaaatg agacttttc agtggaactc taaaccttgt 6480

gatgactact aacaaatgta aaattatgag tgattaagaa aacattgctt tgtggttatc 6540

actttaagtt ttgacaccta gattatagtc ttagtaatag catccactgg aaaaggtgaa 6600

aatgttttat tcagcattta acttacattt gtactttaga gtatttttgt ataaaatcca 6660

tagatttatt ttacatttag agtatttaca ctatgataaa gttgtaaata attttctaag 6720

acagttttta tatagtctac agttgtcctg atttcttatt gaatttgtta gactagttct 6780

cttgtcttgt gatctgtgta caattttagt cactaagact ttcctccaag aactaagcca 6840

acttgatgtg aaaagcacgg ctgtatataa tggtgatgtc ataataaagt tgttttatct 6900

tttaagtaaa aaaaaaaaaa aaaaaaaa 6928

<210> 22
<211> 579
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (459)..(459)
<223> n is a, c, g, or t

<400> 22
ttttgcaaaa tgctcaagtg tatttatgca acagactggc catgtactga ggaggggagc 60

gcaggctgag ggctgaagta ggagtgaggg tcttcctcct gcagccacca agcaaatgat 120

caccatgtcc aagcgtcatt cctgagaccc tgaggtgatg ctcacgtccc cagaacagca 180

tgctggatgc atggccagag gagctcggcc agccccggcg ctggtcctga gaggtggctg 240

caggcggaga gggtaagggc ccctcctcca ggcagcatgt gacccatagc ccacaccctc 300

cacaagaaag cggacgtgga cagtgtgttc aaagctgcag ccgcctgaac aggggcacaa 360

gttccactgt ccttgtaagc caagctcaga ggacatatgg gaggttctcc ttggaggtca 420

ggagggcggc agtgctggtc agagcatgaa ggacactgng acgcctctct ctcagatccc 480

actatgtgac tcctggctgg gctcgggata cgcctccttc gagtgctggg tgtcgcacgg 540

cgcagggcac cagcggacca tgcagccgga ctcttgcaa 579

<210> 23
<211> 396
<212> DNA
<213> Homo sapiens

<400> 23
actccgcctt ccacgtgcac ccactgcctc ttcccttctc gcttgggaac tctagtctcg 60

cctcgggttg caatggaccc caactgctcc tgtgccgctg gtgtctcctg cacctgcgcc 120

agctcctgca agtgcaaaga gtgcaaatgc acctcctgca agaagagctg ctgctcctgc 180

tgccctgtgg gctgtgccaa gtgtgcccaa ggctgcatct gcaaaggggc atcggagaag 240

tgcagctgct gcgcctgatg tcgggacagc cctgctccca agtacaaata gagtgacccg 300

taaaatctag gatttttgt tttttgctac aatcttgacc cctttgctac attccctttt 360

ttctgtgaaa tatgtgaata ataattaaac acttag 396

<210> 24
<211> 1114
<212> DNA
<213> Homo sapiens

<400> 24
tccgcaggcg gaccgggggc aaaggaggtg gcatgtcggt caggcacagc agggtcctgt 60

gtccgcgctg agccgcgctc tccctgctcc agcaaggacc atgagggcgc tggaggggcc 120

aggcctgtcg ctgctgtgcc tggtgttggc gctgcctgcc ctgctgccgg tgccggctgt 180

acgcggagtg gcagaaacac ccacctaccc ctggcgggac gcagagacag gggagcggct 240

ggtgtgcgcc cagtgccccc caggcacctt tgtgcagcgg ccgtgccgcc gagacagccc 300

cacgacgtgt ggcccgtgtc caccgcgcca ctacacgcag ttctggaact acctggagcg 360

ctgccgctac tgcaacgtcc tctgcgggga gcgtgaggag gaggcacggg cttgccacgc 420

cacccacaac cgtgcctgcc gctgccgcac cggcttcttc gcgcacgctg gtttctgctt 480

ggagcacgca tcgtgtccac ctggtgccgg cgtgattgcc ccgggcaccc ccagccagaa 540

cacgcagtgc cagccgtgcc ccccaggcac cttctcagcc agcagctcca gctcagagca 600

gtgccagccc caccgcaact gcacggccct gggcctggcc ctcaatgtgc caggctcttc 660

ctcccatgac accctgtgca ccagctgcac tggcttcccc ctcagcacca gggtaccagg 720

agctgaggag tgtgagcgtg ccgtcatcga ctttgtggct ttccaggaca tctccatcaa 780

gaggctgcag cggctgctgc aggccctcga ggccccggag ggctggggtc cgacaccaag 840

ggcgggccgc gcggccttgc agctgaagct gcgtcggcgg ctcacggagc tcctgggggc 900

gcaggacggg gcgctgctgg tgcggctgct gcaggcgctg cgcgtggcca ggatgcccgg 960

gctggagcgg agcgtccgtg agcgcttcct ccctgtgcac tgatcctggc cccctcttat 1020

ttattctaca tccttggcac cccacttgca ctgaaagagg ctttttttta aatagaagaa 1080

atgaggtttc ttaaaaaaaa aaaaaaaaaa aaaa 1114

<210> 25
<211> 3941
<212> DNA
<213> Homo sapiens

<400> 25
accatctact ccacagtcag ctcatccaca actgccatca cctcaccttt cactaccgca 60

gagactgggg tgacttccac accttcatcc ccatcttctc tgagtacaga catcccgacc 120

acatccctaa gaactctcac cccattatct ttgagcacca gcacttcatt gactacaacc 180

acagaccttc cctctatacc cactgatatc agtagcttac caaccccaat acacatcatt 240

tcatcttctc cctccatcca aagtacagaa acctcatccc ttgtgggcac cacctctccc 300

accatgtcca ctgtgagagc gaccctcaga agtactgaga acaccccaat cagttccttt 360

agcacaagta ttgttgttac acctgaaacc ccaacaacac aggcccctcc tgtactgatg 420

tctgccactg ggacccaaac atcccctgta cctactactg tcacctttgg aagtatggat 480

tcttctacgt ccactcttca tactcttact ccatcaacag ccttgagcaa gatcatgtca 540

acatcacagt ttcctattcc tagcacacat tcctccaccc ttcaaacaac tccttcaatc 600

ccctctttgc aaacttcact cacatctaca agtgagttca ctacagaatc tttcactagg 660

ggaagtacgt ctacaaatgc aatcttgact tcttttagta ccatcatctg gtcctcaaca 720

cccactatta tcatgtcctc ttctccatct tctgccagca taactccagt gttcgctact 780

accattcatt ctgttccttc gtcaccatac attttcagta cagaaaatgt gggctccgct 840

tctatcacag cctttcctag tctctcttcc tcttcaacta ccagcacttc tccaaccagc 900

tcctctctga ccacagctct cactgaaata acccccttt cttatatttc ccttccctcc 960

accacaccct gtccaggaac tataacaatt accatagtcc ctgcctcccc cactgatcca 1020

tgtgttgaaa tggatcccag cactgaagct acttctcctc ccaccactcc attaacagtc 1080

tttcccttta ctactgaaat ggtcacctgt cctagctcca tcagtatgca aactactctt 1140

gctacacata tggacacttc ttccatgacg ccagaaagtg agtccagcat catacctaat 1200

gcttccagtt ccactggcac tgggactgta cccacaaaca cagttttcac aagtactcga 1260

ctgcccacca gtgagacctg gctgagcaac aactctgtga tccccacacc tcttcctggc 1320

gtctctacca tcccgctcac catgaaacca agcagtagcc tcccgaccat cctgaggact 1380

tcaagcaagt caacacaccc atccccaccc accgccagga cttcagagac atcagtggcc 1440

actacccaga ctcctaccac ccttacaacg cgcaggacaa ctcccatcac ttcttggatg 1500

accacacagt ccacgttgac caccactgca ggcacctgtg acaatggtgg cacctgggaa 1560

cagggccagt gtgcttgcct tccggggttt tctggggacc gctgtcagct ccagaccaga 1620

tgccagaacg ggggccagtg ggatggcctc aagtgccagt gccccagcac cttctatggt 1680

tccagttgtg agtttgctgt ggaacaggtg gatctagatg tagtggagac cgaggtgggc 1740

atggaagtgt ctgtggatca gcagttctcg ccggacctca atgacaacac ttcccaggcc 1800

tacagggatt tcaacaagac cttctggaat cagatgcaga agatttttgc agacatgcag 1860

ggcttcacct tcaagggtgt ggagatcctg tccctgagga atggcagcat cgtggtggac 1920

tacctggtcc tgctggagat gcccttcagc ccccagctgg agagcgagta tgagcaggtg 1980

aagaccacgc tgaaggaggg gctccagaac gccagccagg atgcgaacag ctgccaggac 2040

tcccagaccc tgtgttttaa gcctgactcc atcaaggtga acaacaacag caagacagag 2100

ctgaccccgg aagccatctg ccgccgcgcc gctcccacgg gctatgaaga gttctacttc 2160

cctctggtgg aggccacccg gctccgctgt gtcaccaaat gcacgtcggg cgtggacaac 2220

gccatcgact gtcaccaggg ccagtgcgtt ctagagacga gcggtcccgc gtgtcgctgc 2280

tactccaccg acacgcactg gttctctggc ccgcgctgcg aggtggccgt ccactggagg 2340

gcgctggtcg ggggcctgac ggccggcgcc gcgctgctgg tgctgctgct gctggcgctg 2400

ggcgtccggg cggtgcgctc cggatggtgg ggcggccagc gccgaggccg gtcctgggac 2460

caggacagga aatggttcga gacctgggat gaggaagtcg tgggcacttt ttcaaactgg 2520

ggtttcgagg acgacggaac agacaaggat acaaatttcc atgtggcctt ggagaacgtg 2580

gacaccacta tgaaggtgca catcaagaga cccgagatga cctcgtcctc agtgtgagcc 2640

ctgcggggcc ccttcaccac cccctccgcc ctgccccgga cacaagggtc tgcattgcgt 2700

ccatttcaag aggtggcccc aggacgcggg cagcccaggc tcctgctgtt cttgggcaag 2760

atgagactgt tcccccaaat cccatccttc tccttccaac ttggctgaaa cccacctgga 2820

gacgcagttc acgtccaggc tcttccactg tggaatcttg ggcaagtcag taacgagcct 2880

cagtttcctc acctgcaaaa cgggtacagc attcctgtat gatagctcac gccgttgttg 2940

tgaaaaccac atagacttgg tcaattctcg gtcctactct gccctcccgt ctcagccctc 3000

gtgttgccat tgcctctctc ggatcctcca atcctcacgt ccttcacctg gtctctggcc 3060

ctggttctta ttttctctca attccctact gcctgtttct tactttgaac ctggaggcag 3120

cctgcagccc catcccatct cctgccctct cctgatctaa ctccctgctg catctcttgc 3180

tctcattcct tagacgtcct ccccttttga ccccgttcct tcatccatcc tgcaccccag 3240

tcccccagcc ctaaatcctc cctcctctcc tcacatcctg gtccctagca aggtatagat 3300

agcctctgtg tcttaggata ccccgggtgc tgttccctcg gtcaccctgt tgcccagttc 3360

cccgtttctc ttgctctcat tccttgtatc ttctcccctt ctgagcccgt ccattcatcg 3420

gttctgcccc cgactccccc agccctaaat accccagctc ctaattcccc cctcaccccg 3480

ttgctcaatt ccccgtttct cttgctctca ttccttgtat cttctccccc tctgagcctg 3540

tccattcatc ggtggttctg cccctactcc cccagcccta aataccccag ctgctgttcc 3600

tccccatcac ccagccaccg gattctccat tcaccccttt ctctcacccc tggagccccg 3660

tgggtggggg cagggcatga gttccccagt ccccaaggaa aggcagcccc ctcagtctcc 3720

ctcctcctca ttcccttcca tctccctccc ctctgccttt taaacccatc ccctccgatt 3780

cccctcctcc cccctctctc cctggtgtca actcgattcc tgcggtaact ctgagccctg 3840

aaatcctcag tctccttggc ggggaagatt ggctttgggg acaggaagtc ggcacatctc 3900

caggtctcca tgtgcacaat atagagttta ttgtaaaaag c 3941

<210> 26
<211> 454
<212> DNA
<213> Homo sapiens

<400> 26
tctgtcccgc tgcgtgtttt cctcttgatc gggaactcct gcttctcctt gcctcgaaat 60

ggaccccaac tgctcctgct cgcctgttgg ctcctgtgcc tgtgccggct cctgcaaatg 120
caaagagtgc aaatgcacct cctgcaagaa gagctgctgc tcctgctgcc ctgtgggctg 180

tgccaagtgt gcccagggct gcatctgcaa agggacgtca gacaagtgca gctgctgtgc 240

ctgatgccag gacagctgtg ctctcagatg taaatagagc aacctatata aacctggatt 300

ttttttttt tttttttgta caaccctgac ccgtttgcta catcttttt tctatgaaat 360

atgtgaatgg caataaattc atctagacta aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 420

aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaa 454

<210> 27
<211> 1064
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (27)..(27)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (766)..(766)
<223> n is a, c, g, or t

<400> 27
cacagccggg tcgcaggcac ctccccngcc agctctcccg cattctgcac agcttcccga 60

cgcgtctgct gagccccatg gcccacgcca cgctctccgc cgcccccagc aatccccggc 120

tcctgcgggt ggcgctgctg ctcctgctcc tggtgggcag ccggcgcgca gcaggagcgt 180

ccgtggtcac tgaactgcgc tgccagtgct tgcagacact gcagggaatt cacctcaaga 240

acatccaaag tgtgaatgta aggtcccccg gaccccactg cgcccaaacc gaagtcatag 300

ccacactcaa gaatgggaag aaagcttgtc tcaaccccgc atcccccatg gttcagaaaa 360

tcatcgaaaa gatactgaac aaggggagca ccaactgaca ggagagaagt aagaagctta 420

tcagcgtatc attgacactt cctgcagggt ggtccctgcc cttaccagag ctgaaaatga 480

aaaagagaac agcagctttc tagggacagc tggaaaggga cttaatgtgt ttgactattt 540

cttacgaggg ttctacttat ttatgtattt atttttgaaa gcttgtattt taatatttta 600

catgctgtta tttaaagatg tgagtgtgtt tcatcaaaca tagctcagtc ctgattattt 660

aattggaata tgatgggttt taaatgtgtc attaaactaa tatttagtgg gagaccataa 720

tgtgtcagcc accttgataa atgacagggt ggggaactgg agggtngggg gattgaaatg 780

caagcaatta gtggatcact gttagggtaa gggaatgtat gtacacatct atttttata 840

ctttttttt taaaaaagaa tgtcagttgt tatttattca aattatctca cattatgtgt 900

tcaacatttt tatgctgaag tttcccttag acattttatg tcttgcttgt agggcataat 960

gccttgttta atgtccattc tgcagcgttt ctctttccct tggaaaagag aatttatcat 1020

tactgttaca tttgtacaaa tgacatgata ataaaagttt tatg 1064

<210> 28
<211> 2716
<212> DNA
<213> Homo sapiens

<400> 28
gccgcccgct tgcccgtcgg tcgctagctc gctcggtgcg cgtcgtcccg ctccatggcg 60

ctcttcgtgc ggctgctggc tctcgccctg gctctggccc tgggccccgc cgcgaccctg 120

gcgggtcccg ccaagtcgcc ctaccagctg gtgctgcagc acagcaggct ccggggccgc 180

cagcacggcc ccaacgtgtg tgctgtgcag aaggttattg gcactaatag gaagtacttc 240

accaactgca agcagtggta ccaaaggaaa atctgtggca aatcaacagt catcagctac 300

gagtgctgtc ctggatatga aaaggtccct ggggagaagg gctgtccagc agccctacca 360

ctctcaaacc tttacgagac cctgggagtc gttggatcca ccaccactca gctgtacacg 420

gaccgcacgg agaagctgag gcctgagatg gaggggcccg gcagcttcac catcttcgcc 480

cctagcaacg aggcctgggc ctccttgcca gctgaagtgc tggactccct ggtcagcaat 540

gtcaacattg agctgctcaa tgccctccgc taccatatgg tgggcaggcg agtcctgact 600

gatgagctga aacacggcat gaccctcacc tctatgtacc agaattccaa catccagatc 660

caccactatc ctaatgggat tgtaactgtg aactgtgccc ggctgctgaa agccgaccac 720

catgcaacca acggggtggt gcacctcatc gataaggtca tctccaccat caccaacaac 780

atccagcaga tcattgagat cgaggacacc tttgagaccc ttcgggctgc tgtggctgca 840

tcagggctca acacgatgct tgaaggtaac ggccagtaca cgcttttggc cccgaccaat 900

gaggccttcg agaagatccc tagtgagact ttgaaccgta tcctgggcga cccagaagcc 960

ctgagagacc tgctgaacaa ccacatcttg aagtcagcta tgtgtgctga agccatcgtt 1020

gcggggctgt ctgtggagac cctggagggc acgacactgg aggtgggctg cagcggggac 1080

atgctcacta tcaacgggaa ggcgatcatc tccaataaag acatcctagc caccaacggg 1140

gtgatccact acattgatga gctactcatc ccagactcag ccaagacact atttgaattg 1200

gctgcagagt ctgatgtgtc cacagccatt gacctttca gacaagccgg cctcggcaat 1260

catctctctg gaagtgagcg gttgaccctc ctggctcccc tgaattctgt attcaaagat 1320

ggaacccctc caattgatgc ccatacaagg aatttgcttc ggaaccacat aattaaagac 1380

cagctggcct ctaagtatct gtaccatgga cagaccctgg aaactctggg cggcaaaaaa 1440

ctgagagttt ttgtttatcg taatagcctt tgcattgaga acagctgcat cgcggcccac 1500

gacaagaggg ggaggtacgg gaccctgttc acgatggacc gggtgctgac ccccccaatg 1560

gggactgtca tggatgtcct gaagggagac aatcgcttta gcatgctggt agctgccatc 1620

cagtctgcag gactgacgga gaccctcaac cgggaaggag tctacacagt cttcgctccc 1680

acaaatgaag ccttccgagc cctgccacca agagaacgga gcagactctt gggagatgcc 1740

aaggaacttg ccaacatcct gaaataccac attggtgatg aaatcctggt tagcggaggc 1800

atcggggccc tggtgcggct aaagtctctc caaggtgaca agctggaagt cagcttgaaa 1860

aacaatgtgg tgagtgtcaa caaggagcct gttgccgagc ctgacatcat ggccacaaat 1920

ggcgtggtcc atgtcatcac caatgttctg cagcctccag ccaacagacc tcaggaaaga 1980

ggggatgaac ttgcagactc tgcgcttgag atcttcaaac aagcatcagc gttttccagg 2040

gcttcccaga ggtctgtgcg actagcccct gtctatcaaa agttattaga gaggatgaag 2100

cattagcttg aagcactaca ggaggaatgc accacggcag ctctccgcca atttctctca 2160

gatttccaca gagactgttt gaatgttttc aaaaccaagt atcacacttt aatgtacatg 2220

ggccgcacca taatgagatg tgagccttgt gcatgtgggg gaggagggag agagatgtac 2280

tttttaaatc atgttccccc taaacatggc tgttaaccca ctgcatgcag aaacttggat 2340

gtcactgcct gacattcact tccagagagg acctatccca aatgtggaat tgactgccta 2400

tgccaagtcc ctggaaaagg agcttcagta ttgtggggct cataaaacat gaatcaagca 2460

atccagcctc atgggaagtc ctggcacagt ttttgtaaag cccttgcaca gctggagaaa 2520

tggcatcatt ataagctatg agttgaaatg ttctgtcaaa tgtgtctcac atctacacgt 2580

ggcttggagg cttttatggg gccctgtcca ggtagaaaag aaatggtatg tagagcttag 2640

atgtccctat tgtgacagag ccatggtgtg tttgtaataa taaaaccaaa gaaacataaa 2700

aaaaaaaaaa aaaaaa 2716

<210> 29
<211> 1448
<212> DNA
<213> Homo sapiens

<400> 29
gtgaccgagc ggcgcggacg gccgcctgcc ccctctgcca cctggggcgg tgcgggcccg 60

gagcccggag cccgggtagc gcgtagagcc ggcgcgatgc acgtgcgctc actgcgagct 120

gcggcgccgc acagcttcgt ggcgctctgg gcacccctgt tcctgctgcg ctccgccctg 180

gccgacttca gcctggacaa cgaggtgcac tcgagcttca tccaccggcg cctccgcagc 240

caggagcggc gggagatgca gcgcgagatc ctctccattt tgggcttgcc ccaccgcccg 300

cgcccgcacc tccagggcaa gcacaactcg gcacccatgt tcatgctgga cctgtacaac 360

gccatggcgg tggaggaggg cggcgggccc ggcggccagg gcttctccta cccctacaag 420

gccgtcttca gtacccaggg ccccctctg gccagcctgc aagatagcca tttcctcacc 480

gacgccgaca tggtcatgag cttcgtcaac ctcgtggaac atgacaagga attcttccac 540

ccacgctacc accatcgaga gttccggttt gatctttcca agatcccaga aggggaagct 600

gtcacggcag ccgaattccg gatctacaag gactacatcc gggaacgctt cgacaatgag 660

acgttccgga tcagcgttta tcaggtgctc caggagcact tgggcaggga atcggatctc 720

ttcctgctcg acagccgtac cctctgggcc tcggaggagg gctggctggt gtttgacatc 780

acagccacca gcaaccactg ggtggtcaat ccgcggcaca acctgggcct gcagctctcg 840

gtggagacgc tggatgggca gagcatcaac cccaagttgg cgggcctgat tgggcggcac 900

gggccccaga acaagcagcc cttcatggtg gctttcttca aggccacgga ggtccacttc 960

cgcagcatcc ggtccacggg gagcaaacag cgcagccaga accgctccaa gacgcccaag 1020

aaccaggaag ccctgcggat ggccaacgtg gcagagaaca gcagcagcga ccagaggcag 1080

gcctgtaaga agcacgagct gtatgtcagc ttccgagacc tgggctggca ggactggatc 1140

atcgcgcctg aaggctacgc cgcctactac tgtgaggggg agtgtgcctt ccctctgaac 1200

tcctacatga acgccaccaa ccacgccatc gtgcagacgc tggtccactt catcaacccg 1260

gaaacggtgc ccaagccctg ctgtgcgccc acgcagctca atgccatctc cgtcctctac 1320

ttcgatgaca gctccaacgt catcctgaag aaatacagaa acatggtggt ccgggcctgt 1380

ggctgccact agctcctccg agaattcaga ccctttgggg ccaagttttt ctggatcctc 1440

cattgctc 1448

<210> 30
<211> 1379
<212> DNA
<213> Homo sapiens

<400> 30
ggtgaacagt gaacatattt acatttgatt taacagtgaa ccttaattct ttctggcttc 60

acagtgaaac aagtttatgc aatcgatcaa atattttcat ccctgaggtt aacaattacc 120

atcaaaatgt tttgtggaga ctatgtgcaa ggaaccatct tcccagctcc caatttcaat 180

cccataatgg atgcccaaat gctaggagga gcactccaag gatttgactg tgacaaagac 240

atgctgatca acattctgac tcagcgctgc aatgcacaaa ggatgatgat tgcagaggca 300

taccagagca tgtatggccg ggacctgatt ggggatatga agggagcagc tttcggatca 360

cttccaagat gtgatggctg gctcatgtac ccaccaccac tgtatgatgc tcatgagctc 420

tggcatgcca tgaagggagt aggcactgat gagaattgcc tcattgaaat actagcttca 480

agaacaaatg gagaaatttt ccagatgcga gaagcctact gcttgcaata cagcaataac 540

ctccaagagg acatttattc agagacctca ggacacttca gagatactct catgaacttg 600

gtccagggga ccagagagga aggatataca gaccctgcga tggctgctca ggatgcaatg 660

gtcctatggg aagcctgtca gcagaagacg ggggagcaca aaaccatgct gcaaatgatc 720

ctgtgcaaca agagctacca gcagctgcgg ctggttttcc aggaatttca aaatatttct 780

gggcaagata tggtagatgc cattaatgaa tgttatgatg gatactttca ggagctgctg 840

gttgcaattg ttctctgtgt tcgagacaaa ccagcctatt ttgcttatag attatatagt 900

gcaattcatg actttggttt ccataataaa actgtaatca ggattctcat tgccagaagt 960

gaaatagacc tgctgaccat aaggaaacga tacaaagagc gatatggaaa atccctattt 1020

catgatatca gaaattttgc ttcagggcat tataagaaag cactgcttgc catctgtgct 1080

ggtgatgctg aggactacta aaatgaagag gacttggagt actgtgcact cctctttcta 1140

gacacttcca aatagagatt ttctcacaaa tttgtactgt tcatggcact attaacaaaa 1200

ctatacaatc atatttcctc ttctatcctt gaaattattc taagccaaag aaaactatga 1260

atgaaagtat atgatactga atttgcctac tatcctgaat ttgcctacta tctaatcagc 1320

aattaaataa attgtgcatg atggaataat aaaaaaaaaa aaaaaaaaaa aaaaaaaaa 1379

<210> 31
<211> 1935
<212> DNA
<213> Homo sapiens

<400> 31
tctagacagt ggcgcaagag actggggttg cactgggact ccaggaaagg cttagctgtt 60

gacgaaggac cggggcgggg ccgggggggcg gggcgaaggc caggatctcc aggtacccgg 120

aaccccaagg ggcgggtgta gcaggcaatc ttggcgaaac tgggaagggc gggcaggagg 180

gcagggaagc cgctcaccca ggcacaaagc gcctcccgct tgagcggact ccaaagggac 240

ggtccgcggt gtgcagcgag ctgcgctcag gggaccttgc gcccggccct tctgctgcac 300

acagcccacc caggacctcc cgcagcgctg acaggcgggg cgggtgcaaa gacggggcgg 360

ggtctctgcg cccggccccc tcccctgact atcaaagcag cggccggctg tttgggtcca 420

ccacgccttc cacctgcccc actgcttctt cgcttctctc ttggaaagtc cagtctctcc 480

tcggcttgca atggacccca actgctcctg cgccgctggt aaggaacgcc gggttccgtg 540

cctggggatg ctcgattccc agacaccata gagagtgttc ctgggtttga gaaggtcgta 600

ttttgagatc tcaactgtag gggactcctt gacttagtcc agtgctttcc tcttggccaa 660

gatcctgaga gcatttcctt cctctctgtg cctctgtgtc agcgttgagg gtactgaggc 720

tcaaggctgt cctgctccac gtcatgcggt ttgtcccagg gctgttggct gagccccagt 780

gctctgacca ggctttgagc agcaggatta gataggaggc aggggacatt gcctcttcgg 840

ggttcaggac agaaagtcga agtcgccgtc ttcccaggct gtgcctggag cctgggactt 900

tcctttggag tgcaaacagg aggctgcttg gccttcccag catgaaggga gaggacatgg 960

ggcttctctt cctctgctct gagtgggaaa ggagctctga gggctggccc cgcacagagg 1020

aggggcaat ggagactcat taactcactg ctgtacctcc tgcaggtcac tcgccgctca 1080

ctggcttttt tttctctttc tcgcaggtgt ctcctgcacc tgcgctggtt cctgcaagtg 1140

caaagagtgc aaatgcacct cctgcaagaa gagtgagtgt gaggccatct ccatggtctg 1200

gggctgtggc taaggttggg atggaaccca aggctggccc tgagtgcatg cttctgggga 1260

actggccttc ctttgtcccc gtaggttgtc actgcctttc tagtcttctg ccctgtgcag 1320

ggcgcctggg cagctttctc ataggaagac ccaccccaga tatttcccag ttgtctcctg 1380

acaaagccat accctcctga actgagggtc ctttgtggct ggaggctctg ttgggggcct 1440

ctgttgggga gggaggtccc tgggcaagtt ggctgtgacc tctcatgctc ctcttcttcc 1500

ccaggctgct gctcctgctg ccccgtgggc tgtagcaagt gtgcccaggg ctgtgtttgc 1560

aaaggggcgt cagagaagtg cagctgctgc gactgatgcc aggacaacct ttctcccaga 1620

tgtaaacaga gagacatgta caaacctgga ttttttttt ataccacctt gacccatttg 1680

ctacattcct tttcctgtga aatatgtgag tgataattaa acactttaga cctgattctg 1740

acttcagttt cccttatgtg cttcagaaat cagagactgg ggtgggggat cgaactaggg 1800

ttgcagactc ctgggctcta aatggaaatc tgagtcccta acaatcagag tgcattaagg 1860

caagccaggc tgcctcactg tgcttcctct tctgtagaat ggaataacac ttcatcaggt 1920

cattggtggg gatcc 1935

<210> 32
<211> 1408
<212> DNA
<213> Homo sapiens

<400> 32
atttctcttt agttctttgc aagaaggtag agataaagac acttttcaa aaatggcaat 60

ggtatcagaa ttcctcaagc aggcctggtt tattgaaaat gaagagcagg aatatgttca 120

aactgtgaag tcatccaaag gtggtcccgg atcagcggtg agcccctatc ctaccttcaa 180

tccatcctcg gatgtcgctg ccttgcataa ggccataatg gttaaaggtg tggatgaagc 240

aaccatcatt gacattctaa ctaagcgaaa caatgcacag cgtcaacaga tcaaagcagc 300

atatctccag gaaacaggaa agcccctgga tgaaacactg aagaaagccc ttacaggtca 360

ccttgaggag gttgttttag ctctgctaaa aactccagcg caatttgatg ctgatgaact 420

tcgtgctgcc atgaagggcc ttggaactga tgaagatact ctaattgaga ttttggcatc 480

aagaactaac aaagaaatca gagacattaa cagggtctac agagaggaac tgaagagaga 540

tctggccaaa gacataacct cagacacatc tggagatttt cggaacgctt tgctttctct 600

tgctaagggt gaccgatctg aggactttgg tgtgaatgaa gacttggctg attcagatgc 660

cagggccttg tatgaagcag gagaaaggag aaaggggaca gacgtaaacg tgttcaatac 720

catccttacc accagaagct atccacaact tcgcagagtg tttcagaaat acaccaagta 780

cagtaagcat gacatgaaca aagttctgga cctggagttg aaaggtgaca ttgagaaatg 840

cctcacagct atcgtgaagt gcgccacaag caaaccagct ttctttgcag agaagcttca 900

tcaagccatg aaaggtgttg gaactcgcca taaggcattg atcaggatta tggtttcccg 960

ttctgaaatt gacatgaatg atatcaaagc attctatcag aagatgtatg gtatctccct 1020

ttgccaagcc atcctggatg aaaccaaagg agattatgag aaaatcctgg tggctctttg 1080

tggaggaaac taaacattcc cttgatggtc tcaagctatg atcagaagac tttaattata 1140

tattttcatc ctataagctt aaataggaaa gtttcttcaa caggattaca gtgtagctac 1200

ctacatgctg aaaaatatag cctttaaatc atttttatat tataactctg tataatagag 1260

ataagtccat tttttaaaaa tgttttcccc aaaccataaa accctataca agttgttcta 1320

gtaacaatac atgagaaaga tgtctatgta gctgaaaata aaatgacgtc acaagacaaa 1380

aaaaaaaaaa aaaaaaaaaa aaaaaaaa 1408

<210> 33
<211> 399
<212> DNA
<213> Homo sapiens

<400> 33
atgaagtcca gcggcctctt ccccttcctg gtgctgcttg ccctgggaac tctggcacct 60

tgggctgtgg aaggctctgg aaagtccttc aaagctggag tctgtcctcc taagaaatct 120

gcccagtgcc ttagatacaa gaaacctgag tgccagagtg actggcagtg tccagggaag 180

aagagatgtt gtcctgacac ttgtggcatc aaatgcctgg atcctgttga caccccaaac 240

ccaacaagga ggaagcctgg gaagtgccca gtgacttatg gccaatgttt gatgcttaac 300

ccccccaatt tctgtgagat ggatggccag tgcaagcgtg acttgaagtg ttgcatgggc 360

atgtgtggga aatcctgcgt ttcccctgtg aaagcttga 399

<210> 34
<211> 4266
<212> DNA
<213> Homo sapiens

<400> 34
agagtttcag ttttggcagc agcgtccagt gccctgccag tagctcctag agaggcaggg 60

gttaccaact ggccagcagg ctgtgtccct gaagtcagat caacgggaga gaaggaagtg 120

gctaaaacat tgcacaggag aagtcggcct gagtggtgcg gcgctcggga cccaccagca 180

atgctgctct tcgtgctcac ctgcctgctg gcggtcttcc cagccatctc cacgaagagt 240

cccatatttg gtcccgagga ggtgaatagt gtggaaggta actcagtgtc catcacgtgc 300

tactacccac ccacctctgt caaccggcac acccggaagt actggtgccg gcagggagct 360

agaggtggct gcataaccct catctcctcg gagggctacg tctccagcaa atatgcaggc 420

agggctaacc tcaccaactt cccggagaac ggcacatttg tggtgaacat tgcccagctg 480

agccaggatg actccgggcg ctacaagtgt ggcctgggca tcaatagccg aggcctgtcc 540

tttgatgtca gcctggaggt cagccagggt cctgggctcc taaatgacac taaagtctac 600

acagtggacc tgggcagaac ggtgaccatc aactgccctt tcaagactga gaatgctcaa 660

aagaggaagt ccttgtacaa gcagataggc ctgtaccctg tgctggtcat cgactccagt 720

ggttatgtaa atcccaacta tacaggaaga atacgccttg atattcaggg tactggccag 780

ttactgttca gcgttgtcat caaccaactc aggctcagcg atgctgggca gtatctctgc 840

caggctgggg atgattccaa tagtaataag aagaatgctg acctccaagt gctaaagccc 900

gagcccgagc tggtttatga agacctgagg ggctcagtga ccttccactg tgccctgggc 960

cctgaggtgg caaacgtggc caaatttctg tgccgacaga gcagtgggga aaactgtgac 1020

gtggtcgtca acaccctggg gaagagggcc ccagcctttg agggcaggat cctgctcaac 1080

ccccaggaca aggatggctc attcagtgtg gtgatcacag gcctgaggaa ggaggatgca 1140

gggcgctacc tgtgtggagc ccattcggat ggtcagctgc aggaaggctc gcctatccag 1200

gcctggcaac tcttcgtcaa tgaggagtcc acgattcccc gcagccccac tgtggtgaag 1260

ggggtggcag gaggctctgt ggccgtgctc tgcccctaca accgtaagga aagcaaaagc 1320

atcaagtact ggtgtctctg ggaaggggcc cagaatggcc gctgcccccc gctggtggac 1380

agcgaggggt gggttaaggc ccagtacgag ggccgcctct ccctgctgga ggagccaggc 1440

aacggcacct tcactgtcat cctcaaccag ctcaccagcc gggacgccgg cttctactgg 1500

tgtctgacca acggcgatac tctctggagg accaccgtgg agatcaagat tatcgaagga 1560

gaaccaaacc tcaaggtacc agggaatgtc acggctgtgc tgggagagac tctcaaggtc 1620

ccctgtcact ttccatgcaa attctcctcg tacgagaaat actggtgcaa gtggaataac 1680

acgggctgcc aggccctgcc cagccaagac gaaggcccca gcaaggcctt cgtgaactgt 1740

gacgagaaca gccggcttgt ctccctgacc ctgaacctgg tgaccagggc tgatgagggc 1800

tggtactggt gtggagtgaa gcagggccac ttctatggag agactgcagc cgtctatgtg 1860

gcagttgaag agaggaaggc agcggggtcc cgcgatgtca gcctagcgaa ggcagacgct 1920

gctcctgatg agaaggtgct agactctggt tttcgggaga ttgagaacaa agccattcag 1980

gatcccaggc tttttgcaga ggaaaaggcg gtggcagata caagagatca agccgatggg 2040

agcagagcat ctgtggattc cggcagctct gaggaacaag gtggaagctc cagagcgctg 2100

gtctccaccc tggtgcccct gggcctggtg ctggcagtgg gagccgtggc tgtgggggtg 2160

gccagagccc ggcacaggaa gaacgtcgac cgagtttcaa tcagaagcta caggacagac 2220

attagcatgt cagacttcga gaactccagg gaatttggag ccaatgacaa catgggagcc 2280

tcttcgatca ctcaggagac atccctcgga ggaaaagaag agtttgttgc caccactgag 2340

agcaccacag agaccaaaga acccaagaag gcaaaaaggt catccaagga ggaagccgag 2400

atggcctaca aagacttcct gctccagtcc agcaccgtgg ccgccgaggc ccaggacggc 2460

ccccaggaag cctagacggt gtcgccgcct gctccctgca cccatgacaa tcaccttcag 2520

aatcatgtcg atcctggggc cctcagctcc tggggacccc actccctgct ctaacacctg 2580

cctaggtttt tcctactgtc ctcagaggcg tgctggtccc ctcctcagtg acatcaaagc 2640

ctggcctaat tgttcctatt ggggatgagg gtggcatgag gaggtcccac ttgcaacttc 2700

tttctgttga gagaacctca ggtacggaga agaatagagg tcctcatggg tcccttgaag 2760

gaagagggac cagggtggga gagctgattg cagaaaggag agacgtgcag cgcccctctg 2820

cacccttatc atgggatgtc aacagaattt ttccctccac tccatccctc cctcccgtcc 2880

ttcccctctt cttctttcct tccatcaaaa gatgtatttg aattcatact agaattcagg 2940

tgctttgcta gatgctgtga caggtatgcc accaacactg ctcacagcct ttctgaggac 3000

accagtgaaa gaagccacag ctcttcttgg cgtatttata ctcactgagt cttaactttt 3060

caccaggggt gctcacctct gcccctattg ggagaggtca taaaatgtct cgagtcctaa 3120

ggccttaggg gtcatgtatg atgagcatac acacaggtaa ttataaaccc acattcttac 3180

catttcacac ataagaaaat tgaggtttgg aagagtgaag cgtttttctt tttctttttt 3240

ttttttgaga cggagtctct cactgtcgcc caggctggag tgcagtggcg caatctcggc 3300

tcactgcaac ctccgcctcc caggttgaca ccattctcct gcctcaccct cccaagtagc 3360

tgggactaca ggcgcctgcc agcacgcctg gctaattttt tgtattttta gtagagacag 3420

ggtttcaccg tgttagccag gatggtctcg atctcctgac ctcgtgatcc gcctgcctct 3480

gcctcccaaa gtgctgggat tacaggcgtg agccaccgcg tccggcctct ttttttcttt 3540

tctttttttt gagacaaagt ctcactgtgt cacccagact ggaatgcagt gacacaatct 3600

cggctcactg aaacctctgc cttccaggtt caagctattc tcatgcctca gcctctcaag 3660

tagctgggac tacagatgtg ggccaccatg tctggctaat tttttttttt tttttttttt 3720

tttgtagaga cagggtttcg ccatgttgac gagactggtc tcgaactcct ggcctcaagt 3780

gatctgccgc ctcagcttct caaagtactg ggattatata ggcatgagcc actgagcctg 3840

gccctgaagc gtttttctca aaggccctca gtgagataaa ttagatttgg catctcctgt 3900

cctgggccag ggatctctct acaagagccc ctgcccctct gttggaggca cagttttaga 3960

ataaggagga ggagggagaa gagaaaatgt aaaggaggga gatctttccc aggccgcacc 4020

atttctgtca ctcacatgga cccaagataa aagaatggcc aaaccctcac aacccctgat 4080

gtttgaagag ttccaagttg aagggaaaca aagaagtgtt tgatggtgcc agagaggggc 4140

tgctctccag aaagctaaaa tttaatttct tttttcctct gagttctgta cttcaaccag 4200

cctacaagct ggcacttgct aacaaatcag aaatatgaca attaatgatt aaagactgtg 4260

attgcc 4266

<210> 35
<211> 2974
<212> DNA
<213> Homo sapiens

<400> 35
ctcagggcag agggaggaag gacagcagac cagacagtca cagcagcctt gacaaaacgt 60

tcctggaact caagctcttc tccacagagg aggacagagc agacagcaga gaccatggag 120

tctccctcgg cccctcccca cagatggtgc atcccctggc agaggctcct gctcacagcc 180

tcacttctaa ccttctggaa cccgcccacc actgccaagc tcactattga atccacgccg 240

ttcaatgtcg cagaggggaa ggaggtgctt ctacttgtcc acaatctgcc ccagcatctt 300

tttggctaca gctggtacaa aggtgaaaga gtggatggca accgtcaaat tataggatat 360

gtaataggaa ctcaacaagc taccccaggg cccgcataca gtggtcgaga gataatatac 420

cccaatgcat ccctgctgat ccagaacatc atccagaatg acacaggatt ctacacccta 480

cacgtcataa agtcagatct tgtgaatgaa gaagcaactg gccagttccg ggtatacccg 540

gagctgccca agccctccat ctccagcaac aactccaaac ccgtggagga caaggatgct 600

gtggccttca cctgtgaacc tgagactcag gacgcaacct acctgtggtg ggtaaacaat 660

cagagcctcc cggtcagtcc caggctgcag ctgtccaatg gcaacaggac cctcactcta 720

ttcaatgtca caagaaatga cacagcaagc tacaaatgtg aaacccagaa cccagtgagt 780

gccaggcgca gtgattcagt catcctgaat gtcctctatg gcccggatgc ccccaccatt 840

tcccctctaa acacatctta cagatcaggg gaaaatctga acctctcctg ccacgcagcc 900

tctaacccac ctgcacagta ctcttggttt gtcaatggga ctttccagca atccacccaa 960

gagctcttta tccccaacat cactgtgaat aatagtggat cctatacgtg ccaagcccat 1020

aactcagaca ctggcctcaa taggaccaca gtcacgacga tcacagtcta tgcagagcca 1080

cccaaaccct tcatcaccag caacaactcc aaccccgtgg aggatgagga tgctgtagcc 1140

ttaacctgtg aacctgagat tcagaacaca acctacctgt ggtgggtaaa taatcagagc 1200

ctcccggtca gtcccaggct gcagctgtcc aatgacaaca ggaccctcac tctactcagt 1260

gtcacaagga atgatgtagg accctatgag tgtggaatcc agaacgaatt aagtgttgac 1320

cacagcgacc cagtcatcct gaatgtcctc tatggcccag acgaccccac catttccccc 1380

tcatacacct attaccgtcc aggggtgaac ctcagcctct cctgccatgc agcctctaac 1440

ccacctgcac agtattcttg gctgattgat gggaacatcc agcaacacac acaagagctc 1500

tttatctcca acatcactga gaagaacagc ggactctata cctgccaggc caataactca 1560

gccagtggcc acagcaggac tacagtcaag acaatcacag tctctgcgga gctgcccaag 1620

ccctccatct ccagcaacaa ctccaaaccc gtggaggaca aggatgctgt ggccttcacc 1680

tgtgaacctg aggctcagaa cacaacctac ctgtggtggg taaatggtca gagcctccca 1740

gtcagtccca ggctgcagct gtccaatggc aacaggaccc tcactctatt caatgtcaca 1800

agaaatgacg caagagccta tgtatgtgga atccagaact cagtgagtgc aaaccgcagt 1860

gacccagtca ccctggatgt cctctatggg ccggacaccc ccatcatttc ccccccagac 1920

tcgtcttacc tttcgggagc gaacctcaac ctctcctgcc actcggcctc taacccatcc 1980

ccgcagtatt cttggcgtat caatgggata ccgcagcaac acacacaagt tctctttatc 2040

gccaaaatca cgccaaataa taacgggacc tatgcctgtt ttgtctctaa cttggctact 2100

ggccgcaata attccatagt caagagcatc acagtctctg catctggaac ttctcctggt 2160

ctctcagctg gggccactgt cggcatcatg attggagtgc tggttggggt tgctctgata 2220

tagcagccct ggtgtagttt cttcatttca ggaagactga cagttgtttt gcttcttcct 2280

taaagcattt gcaacagcta cagtctaaaa ttgcttcttt accaaggata tttacagaaa 2340

agactctgac cagagatcga gaccatccta gccaacatcg tgaaacccca tctctactaa 2400

aaatacaaaa atgagctggg cttggtggcg cgcacctgta gtcccagtta ctcgggaggc 2460

tgaggcagga gaatcgcttg aacccgggag gtggagattg cagtgagccc agatcgcacc 2520

actgcactcc agtctggcaa cagagcaaga ctccatctca aaaagaaaag aaaagaagac 2580

tctgacctgt actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa 2640

aactttaatg aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa 2700

taattaattt catgggacta aatgaactaa tgaggattgc tgattcttta aatgtcttgt 2760

ttcccagatt tcaggaaact ttttttcttt taagctatcc actcttacag caatttgata 2820

aaatatactt ttgtgaacaa aaattgagac atttacattt tctccctatg tggtcgctcc 2880

agacttggga aactattcat gaatatttat attgtatggt aatatagtta ttgcacaagt 2940

tcaataaaaa tctgctcttt gtataacaga aaaa 2974

<210> 36

<211> 4767
<212> DNA
<213> Homo sapiens

<400> 36
gcctcccgcc gcctcccgcg cggccatgga ctgagcgccg ccggccaggc cgcggggatg 60

gggccgccgc tcccgctgct gctgctgcta ctgctgctgc tgccgccacg cgtcctgcct 120

gccgcccctt cgtccgtccc ccgcggccgg cagctcccgg ggcgtctggg ctgcctgctc 180

gaggagggcc tctgcggagc gtccgaggcc tgtgtgaacg atggagtgtt tggaaggtgc 240

cagaaggttc cggcaatgga cttttaccgc tacgaggtgt cgcccgtggc cctgcagcgc 300

ctgcgcgtgg cgttgcagaa gctttccggc acaggtttca cgtggcagga tgactatact 360

cagtatgtga tggaccagga acttgcagac ctcccgaaaa cctacctgag gcgtcctgaa 420

gcatccagcc cagccaggcc ctcaaaacac agcgttggca gcgagaggag gtacagtcgg 480

gagggcggtg ctgccctggc caacgccctc cgacgccacc tgcccttcct ggaggccctg 540

tcccaggccc cagcctcaga cgtgctcgcc aggacccata cggcgcagga cagacccccc 600

gctgagggtg atgaccgctt ctccgagagc atcctgacct atgtggccca cacgtctgcg 660

ctgacctacc ctcccgggcc ccggacccag ctccgcgagg acctcctgcc gcggaccctc 720

ggccagctcc agccagatga gctcagccct aaggtggaca gtggtgtgga cagacaccat 780

ctgatggcgg ccctcagtgc ctatgctgcc cagaggcccc cagctccccc cggggagggc 840

agcctggagc cacagtacct tctgcgtgca ccctcaagaa tgcccaggcc tttgctggca 900

ccagccgccc cccagaagtg gccttcacct ctgggagatt ccgaagaccc ctccagcaca 960

ggcgatggag cacggattca taccctcctg aaggacctgc agaggcagcc ggctgaggtg 1020

aggggcctga gtggcctgga gctggacggc atggctgagc tgatggctgg cctgatgcaa 1080

ggcgtggacc atggagtagc tcgaggcagc cctgggagag cggccctggg agagtctgga 1140

gaacaggcgg atggccccaa ggccaccctc cgtggagaca gctttccaga tgacggagtg 1200

caggacgacg atgatagact ttaccaagag gtccatcgtc tgagtgccac actcgggggc 1260

ctcctgcagg accacgggtc tcgactctta cctggagccc tcccctttgc aaggcccctc 1320

gacatggaga ggaagaagtc cgagcaccct gagtcttccc tgtcttcaga agaggagact 1380

gccggagtgg agaacgtcaa gagccagacg tattccaaag atctgctggg gcagcagccg 1440

cattcggagc ccggggccgc tgcgtttggg gagctccaaa accagatgcc tgggccctcg 1500

aaggaggagc agagccttcc agcgggtgct caggaggccc tcagcgacgg cctgcaattg 1560

gaggtccagc cttccgagga agaggcgcgg ggctacatcg tgacagacag agacccctg 1620

cgccccgagg aaggaaggcg gctggtggag gacgtcgccc gcctcctgca ggtgcccagc 1680

agtgcgttcg ctgacgtgga ggttctcgga ccagcagtga ccttcaaagt gagcgccaat 1740

gtccaaaacg tgaccactga ggatgtggag aaggccacag ttgacaacaa agacaaactg 1800

gaggaaacct ctggactgaa aattcttcaa accggagtcg ggtcgaaaag caaactcaag 1860

ttcctgcctc ctcaggcgga gcaagaagac tccaccaagt tcatcgcgct caccctggtc 1920

tccctcgcct gcatcctggg cgtcctcctg gcctctggcc tcatctactg cctccgccat 1980

agctctcagc acaggctgaa ggagaagctc tcgggactag ggggcgaccc aggtgcagat 2040

gccactgccg cctaccagga gctgtgccgc cagcgtatgg ccacgcggcc accagaccga 2100

cctgagggcc cgcacacgtc acgcatcagc agcgtctcat cccagttcag cgacgggccg 2160

atccccagcc cctccgcacg cagcagcgcc tcatcctggt ccgaggagcc tgtgcagtcc 2220

aacatggaca tctccaccgg ccacatgatc ctgtcctaca tggaggacca cctgaagaac 2280

aagaaccggc tggagaagga gtgggaagcg ctgtgcgcct accaggcgga gcccaacagc 2340

tcgttcgtgg cccagaggga ggagaacgtg cccaagaacc gctccctggc tgtgctgacc 2400

tatgaccact cccgggtcct gctgaaggcg gagaacagcc acagccactc agactacatc 2460

aacgctagcc ccatcatgga tcacgacccg aggaaccccg cgtacatcgc cacccaggga 2520

ccgctgcccg ccaccgtggc tgacttttgg cagatggtgt gggagagcgg ctgcgtggtg 2580

atcgtcatgc tgacacccct cgcggagaac ggcgtccggc agtgctacca ctactggccg 2640

gatgaaggct ccaatctcta ccacatctat gaggtgaacc tggtctccga gcacatctgg 2700

tgtgaggact tcctggtgag gagcttctat ctgaagaacc tgcagaccaa cgagacgcgc 2760

accgtgacgc agttccactt cctgagttgg tatgaccgag gagtcccttc ctcctcaagg 2820

tccctcctgg acttccgcag aaaagtaaac aagtgctaca ggggccgttc ttgtccaata 2880

attgttcatt gcagtgacgg tgcaggccgg agcggcacct acgtcctgat cgacatggtt 2940

ctcaacaaga tggccaaagg tgctaaagag attgatatcg cagcgaccct ggagcacttg 3000

agggaccaga gacccggcat ggtccagacg aaggagcagt ttgagttcgc gctgacagcc 3060

gtggctgagg aggtgaacgc catcctcaag gcccttcccc agtgagcggc agcctcaggg 3120

gcctcagggg agcccccacc ccacggatgt tgtcaggaat catgatctga ctttaattgt 3180

gtgtcttcta ttataactgc atagtaatag ggcccttagc tctcccgtag tcagcgcagt 3240

ttagcagtta aaagtgtatt tttgtttaat caaacaataa taaagagaga tttgtggaaa 3300

aatccagtta cgggtggagg ggaatcggtt catcaatttt cacttgctta aaaaaaatac 3360

tttttcttaa agcacccgtt caccttcttg gttgaagttg tgttaacaat gcagtagcca 3420

gcacgttcga ggcggtttcc aggaagagtg tgcttgtcat ctgccacttt cgggagggtg 3480

gatccactgt gcaggagtgg ccggggaagc tggcagcact cagtgaggcc gcccggcaca 3540

caaggcacgt ttggcatttc tctttgagag agtttatcat tgggagaagc cgcggggaca 3600

gaactgaacg tcctgcagct tcggggcaag tgagacaatc acagctcctc gctgcgtctc 3660

catcaacact gcgccgggta ccatggacgg ccccgtcagc cacacctgtc agcccaagca 3720

gagtgattca ggggctcccc gggggcagac acctgtgcac cccatgagta gtgcccactt 3780

gaggctggca ctcccctgac ctcacctttg caaagttaca gatgcacccc aacattgaga 3840

tgtgttttta atgttaaaat attgatttct acgttatgaa aacagatgcc cccgtgaatg 3900

cttacctgtg agataaccac aaccaggaag aacaaatctg ggcattgagc aagctatgag 3960

ggtccccggg agcacacgaa ccctgccagg cccccgctgg ctcctccagg cacgtcccgg 4020

acctgtgggg ccccagagag gggacatttc cctcctggga gagaaggaga tcagggcaac 4080

tcggagaggg ctgcgagcat ttccctcccg ggagaggaga tcagggcgac ctgcacgcac 4140

tgcgtagagc ctggaaggga agtgagaaac cagccgaccg gccctgcccc tcttcccggg 4200

atcacttaat gaaccacgtg ttttgacatc atgtaaacct aagcacgtag agatgattcg 4260

gatttgacaa aataacattt gagtatccga ttcgccatca ccccctaccc cagaaatagg 4320

acaattcact tcattgacca ggatgatcac atggaaggcg gcgcagaggc agctgtgtgg 4380

gctgcagatt tcctgtgtgg ggttcagcgt agaaaacgca cctccatccc gcccttccca 4440

cagcattcct ccatcttaga tagatggtac tctccaaagg ccctaccaga gggaacacgg 4500

cctactgagc ggacagaatg atgccaaaat attgcttatg tctctacatg gtattgtaat 4560

gaatatctgc tttaatatag ctatcatttc ttttccaaaa ttacttctct ctatctggaa 4620

tttaattaat cgaaatgaat ttatctgaat ataggaagca tatgcctact tgtaatttct 4680

aactccttat gtttgaagag aaacctccgg tgtgagatat acaaatatat ttaattgtgt 4740

catattaaac ttctgattca aaaaaaa 4767

<210> 37
<211> 6129
<212> DNA
<213> Homo sapiens

<400> 37
aattggaagc aaatgacatc acagcaggtc agagaaaaag ggttgagcgg caggcaccca 60

gagtagtagg tctttggcat taggagcttg agcccagacg gccctagcag ggaccccagc 120

gcccgagaga ccatgcagag gtcgcctctg gaaaaggcca gcgttgtctc caaacttttt 180

ttcagctgga ccagaccaat tttgaggaaa ggatacagac agcgcctgga attgtcagac 240

atataccaaa tcccttctgt tgattctgct gacaatctat ctgaaaaatt ggaaagagaa 300

tgggatagag agctggcttc aaagaaaaat cctaaactca ttaatgccct tcggcgatgt 360

ttttctgga gatttatgtt ctatggaatc tttttatatt taggggaagt caccaaagca 420

gtacagcctc tcttactggg aagaatcata gcttcctatg acccggataa caaggaggaa 480

cgctctatcg cgatttatct aggcataggc ttatgccttc tctttattgt gaggacactg 540

ctcctacacc cagccatttt tggccttcat cacattggaa tgcagatgag aatagctatg 600

tttagtttga tttataagaa gactttaaag ctgtcaagcc gtgttctaga taaaataagt 660

attggacaac ttgttagtct cctttccaac aacctgaaca aatttgatga aggacttgca 720

ttggcacatt tcgtgtggat cgctcctttg caagtggcac tcctcatggg gctaatctgg 780

gagttgttac aggcgtctgc cttctgtgga cttggtttcc tgatagtcct tgccctttt 840

caggctgggc tagggagaat gatgatgaag tacagagatc agagagctgg gaagatcagt 900

gaaagacttg tgattacctc agaaatgatt gaaaatatcc aatctgttaa ggcatactgc 960

tgggaagaag caatggaaaa aatgattgaa aacttaagac aaacagaact gaaactgact 1020

cggaaggcag cctatgtgag atacttcaat agctcagcct tcttcttctc agggttcttt 1080

gtggtgtttt tatctgtgct tccctatgca ctaatcaaag gaatcatcct ccggaaaata 1140

ttcaccacca tctcattctg cattgttctg cgcatggcgg tcactcggca atttccctgg 1200

gctgtacaaa catggtatga ctctcttgga gcaataaaca aaatacagga tttcttacaa 1260

aagcaagaat ataagacatt ggaatataac ttaacgacta cagaagtagt gatggagaat 1320

gtaacagcct tctgggagga gggatttggg gaattatttg agaaagcaaa acaaaacaat 1380

aacaatagaa aaacttctaa tggtgatgac agcctcttct tcagtaattt ctcacttctt 1440

ggtactcctg tcctgaaaga tattaatttc aagatagaaa gaggacagtt gttggcggtt 1500

gctggatcca ctggagcagg caagacttca cttctaatga tgattatggg agaactggag 1560

ccttcagagg gtaaaattaa gcacagtgga agaatttcat tctgttctca gttttcctgg 1620

attatgcctg gcaccattaa agaaaatatc atctttggtg tttcctatga tgaatataga 1680

tacagaagcg tcatcaaagc atgccaacta gaagaggaca tctccaagtt tgcagagaaa 1740

gacaatatag ttcttggaga aggtggaatc acactgagtg gaggtcaacg agcaagaatt 1800

tctttagcaa gagcagtata caaagatgct gatttgtatt tattagactc tccttttgga 1860

tacctagatg ttttaacaga aaaagaaata tttgaaagct gtgtctgtaa actgatggct 1920

aacaaaacta ggattttggt cacttctaaa atggaacatt taaagaaagc tgacaaaata 1980

ttaattttga atgaaggtag cagctatttt tatgggacat tttcagaact ccaaaatcta 2040

cagccagact ttagctcaaa actcatggga tgtgattctt tcgaccaatt tagtgcagaa 2100

agaagaaatt caatcctaac tgagacctta caccgtttct cattagaagg agatgctcct 2160

gtctcctgga cagaaacaaa aaaacaatct tttaaacaga ctggagagtt tggggaaaaa 2220

aggaagaatt ctattctcaa tccaatcaac tctatacgaa aattttccat tgtgcaaaag 2280

actcccttac aaatgaatgg catcgaagag gattctgatg agcctttaga gagaaggctg 2340

tccttagtac cagattctga gcagggagag gcgatactgc ctcgcatcag cgtgatcagc 2400

actggcccca cgcttcaggc acgaaggagg cagtctgtcc tgaacctgat gacacactca 2460

gttaaccaag gtcagaacat tcaccgaaag acaacagcat ccacacgaaa agtgtcactg 2520

gcccctcagg caaacttgac tgaactggat atatattcaa gaaggttatc tcaagaaact 2580

ggcttggaaa taagtgaaga aattaacgaa gaagacttaa aggagtgcct ttttgatgat 2640

atggagagca taccagcagt gactacatgg aacacatacc ttcgatatat tactgtccac 2700

aagagcttaa tttttgtgct aatttggtgc ttagtaattt ttctggcaga ggtggctgct 2760

tctttggttg tgctgtggct ccttggaaac actcctcttc aagacaaagg gaatagtact 2820

catagtagaa ataacagcta tgcagtgatt atcaccagca ccagttcgta ttatgtgttt 2880

tacatttacg tgggagtagc cgacactttg cttgctatgg gattcttcag aggtctacca 2940

ctggtgcata ctctaatcac agtgtcgaaa attttacacc acaaaatgtt acattctgtt 3000

cttcaagcac ctatgtcaac cctcaacacg ttgaaagcag gtgggattct taatagattc 3060

tccaaagata tagcaatttt ggatgacctt ctgcctctta ccatatttga cttcatccag 3120

ttgttattaa ttgtgattgg agctatagca gttgtcgcag ttttacaacc ctacatcttt 3180

gttgcaacag tgccagtgat agtggctttt attatgttga gagcatattt cctccaaacc 3240

tcacagcaac tcaaacaact ggaatctgaa ggcaggagtc caattttcac tcatcttgtt 3300

acaagcttaa aaggactatg gacacttcgt gccttcggac ggcagcctta ctttgaaact 3360

ctgttccaca aagctctgaa tttacatact gccaactggt tcttgtacct gtcaacactg 3420

cgctggttcc aaatgagaat agaaatgatt tttgtcatct tcttcattgc tgttaccttc 3480

atttccattt taacaacagg agaaggagaa ggaagagttg gtattatcct gactttagcc 3540

atgaatatca tgagtacatt gcagtgggct gtaaactcca gcatagatgt ggatagcttg 3600

atgcgatctg tgagccgagt ctttaagttc attgacatgc caacagaagg taaacctacc 3660

aagtcaacca aaccatacaa gaatggccaa ctctcgaaag ttatgattat tgagaattca 3720

cacgtgaaga aagatgacat ctggccctca gggggccaaa tgactgtcaa agatctcaca 3780

gcaaaataca cagaaggtgg aaatgccata ttagagaaca tttccttctc aataagtcct 3840

ggccagaggg tgggcctctt gggaagaact ggatcaggga agagtacttt gttatcagct 3900

tttttgagac tactgaacac tgaaggagaa atccagatcg atggtgtgtc ttgggattca 3960

ataactttgc aacagtggag gaaagccttt ggagtgatac cacagaaagt atttatttt 4020

tctggaacat ttagaaaaaa cttggatccc tatgaacagt ggagtgatca agaaatatgg 4080

aaagttgcag atgaggttgg gctcagatct gtgatagaac agtttcctgg gaagcttgac 4140

tttgtccttg tggatggggg ctgtgtccta agccatggcc acaagcagtt gatgtgcttg 4200

gctagatctg ttctcagtaa ggcgaagatc ttgctgcttg atgaacccag tgctcatttg 4260

gatccagtaa cataccaaat aattagaaga actctaaaac aagcatttgc tgattgcaca 4320

gtaattctct gtgaacacag gatagaagca atgctggaat gccaacaatt tttggtcata 4380

gaagagaaca aagtgcggca gtacgattcc atccagaaac tgctgaacga gaggagcctc 4440

ttccggcaag ccatcagccc ctccgacagg gtgaagctct ttccccaccg gaactcaagc 4500

aagtgcaagt ctaagcccca gattgctgct ctgaaagagg agacagaaga agaggtgcaa 4560

gatacaaggc tttagagagc agcataaatg ttgacatggg acatttgctc atggaattgg 4620

agctcgtggg acagtcacct catggaattg gagctcgtgg aacagttacc tctgcctcag 4680

aaaacaagga tgaattaagt tttttttaa aaaagaaaca tttggtaagg ggaattgagg 4740

acactgatat gggtcttgat aaatggcttc ctggcaatag tcaaattgtg tgaaaggtac 4800

ttcaaatcct tgaagattta ccacttgtgt tttgcaagcc agattttcct gaaaaccctt 4860

gccatgtgct agtaattgga aaggcagctc taaatgtcaa tcagcctagt tgatcagctt 4920

attgtctagt gaaactcgtt aatttgtagt gttggagaag aactgaaatc atacttctta 4980

gggttatgat taagtaatga taactggaaa cttcagcggt ttatataagc ttgtattcct 5040

ttttctctcc tctccccatg atgtttagaa acacaactat attgtttgct aagcattcca 5100

actatctcat ttccaagcaa gtattagaat accacaggaa ccacaagact gcacatcaaa 5160

atatgcccca ttcaacatct agtgagcagt caggaaagag aacttccaga tcctggaaat 5220

cagggttagt attgtccagg tctaccaaaa atctcaatat ttcagataat cacaatacat 5280

cccttacctg ggaaagggct gttataatct ttcacagggg acaggatggt tcccttgatg 5340

aagaagttga tatgcctttt cccaactcca gaaagtgaca agctcacaga cctttgaact 5400

agagtttagc tggaaaagta tgttagtgca aattgtcaca ggacagccct tctttccaca 5460

gaagctccag gtagagggtg tgtaagtaga taggccatgg gcactgtggg tagacacaca 5520

tgaagtccaa gcatttagat gtataggttg atggtggtat gttttcaggc tagatgtatg 5580

tacttcatgc tgtctacact aagagagaat gagagacaca ctgaagaagc accaatcatg 5640

aattagtttt atatgcttct gttttataat tttgtgaagc aaaatttttt ctctaggaaa 5700

tatttatttt aataatgttt caaacatata ttacaatgct gtattttaaa agaatgatta 5760

tgaattacat ttgtataaaa taatttttat atttgaaata ttgacttttt atggcactag 5820

tatttttatg aaatattatg ttaaaactgg gacaggggag aacctagggt gatattaacc 5880

aggggccatg aatcaccttt tggtctggag ggaagccttg gggctgatcg agttgttgcc 5940

cacagctgta tgattcccag ccagacacag cctcttagat gcagttctga agaagatggt 6000

accaccagtc tgactgtttc catcaagggt acactgcctt ctcaactcca aactgactct 6060

taagaagact gcattatatt tattactgta agaaaatatc acttgtcaat aaaatccata 6120

catttgtgt 6129

<210> 38
<211> 2645
<212> DNA
<213> Homo sapiens

<400> 38
cacaagaata ctgaaaaatg aagcctaaaa tgaagtattc aaccaacaaa atttccacag 60

caaagtggaa gaacacagca agcaaagcct tgtgtttcaa gctgggaaaa tcccaacaga 120

aggccaaaga agtttgcccc atgtacttta tgaagctccg ctctggcctt atgataaaaa 180

aggaggcctg ttactttagg agagaaacca ccaaaaggcc ttcactgaaa acaggtagaa 240

agcacaaaag acatctggta ctcgctgcct gtcaacagca gtctactgtg gagtgctttg 300

cctttggtat atcaggggtc cagaaatata ctagagcact tcatgattca agtatcacag 360

gaatttcacc tattacagag tatcttgctt ctctaagcac atacaatgat caatccatta 420

cttttgcttt ggaggatgaa agttatgaga tatatgttga agacttgaaa aaagatgaaa 480

agaaagataa ggtgttactg agttactatg agtctcaaca cccctcaaat gaatcaggtg 540

acggtgttga tggtaagatg ttaatggtaa ccctgagtcc tacaaaagac ttctggttgc 600

atgccaacaa caaggaacac tctgtggagc tccataagtg tgaaaaacca ctgccagacc 660

aggccttctt tgtccttcat aatatgcact ccaactgtgt ttcatttgaa tgcaagactg 720

atcctggagt gtttataggt gtaaaggata atcatcttgc tctgattaaa gtagactctt 780

ctgagaattt gtgtactgaa aatatcttgt ttaagctctc tgaaacttag ttgatggaaa 840

cctgtgagtc ttgggttgag tacccaaatg ctaccactgg agaaggaatg agagataaag 900

aaagagacag gtgacatcta agggaaatga agagtgctta gcatgtgtgg aatgttttcc 960

atattatgta taaaaatatt ttttctaatc ctccagttat tcttttattt ccctctgtat 1020

aactgcatct tcaatacaag tatcagtata ttaaataggg tattggtaaa gaaacggtca 1080

acattctaaa gagatacagt ctgaccttta cttttctcta gtttcagtcc agaaagaact 1140

tcatatttag agctaaggcc actgaggaaa gagccatagc ttaagtctct atgtagacag 1200

ggatccattt taaagagcta cttagagaaa taattttcca cagttccaaa cgataggctc 1260

aaacactaga gctgctagta aaaagaagac cagatgcttc acagaattat catttttca 1320

actggaataa aacaccaggt ttgtttgtag atgtcttagg caacactcag agcagatctc 1380

ccttactgtc aggggatatg gaacttcaaa ggcccacatg gcaagccagg taacataaat 1440

gtgtgaaaaa gtaaagataa ctaaaaaatt tagaaaaata aatccagtat ttgtaaagtg 1500

aataacttca tttctaattg tttaattttt aaaattctga tttttatata ttgagtttaa 1560

gcaaggcatt cttacacgag gaagtgaagt aaattttagt tcagacataa aatttcactt 1620

attaggaata tgtaacatgc taaaactttt tttttttaa agagtactga gtcacaacat 1680

gttttagagc atccaagtac catataatcc aactatcatg gtaaggccag aaatcttcta 1740

acctaccaga gcctagatga gacaccgaat taacattaaa atttcagtaa ctgactgtcc 1800

ctcatgtcca tggcctacca tcccttctga ccctggcttc cagggaccta tgtcttttaa 1860

tactcactgt cacattgggc aaagttgctt ctaatcctta tttcccatgt gcacaagtct 1920

ttttgtattc cagcttcctg ataacactgc ttactgtgga atattcattt gacatctgtc 1980

tcttttcatt tcttttaact accatgccct tgatatatct tttgcacctg ctgaacttca 2040

tttctgtatc acctgacctc tggatgccaa aacgtttatt ctgctttgtc tgttgtagaa 2100

ttttagataa agctattaat ggcaatattt ttttgctaaa cgtttttgtt ttttactgtc 2160

actagggcaa taaaatttat actcaaccat ataataacat tttttaacta cataaaggag 2220

tagtttttat tttaaagtct tagcaatttc tattacaact tttcttagac ttaacactta 2280

tgataaatga ctaacatagt aacagaatct ttatgaaata tgacctttc tgaaaataca 2340

tacttttaca tttctacttt attgagacct attagatgta agtgctagta gaatataaga 2400

taaaagaggc tgagaattac catacaaggg tattacaact gtaaaacaat ttatctttgt 2460

ttcattgttc tgtcaataat tgttaccaaa gagataaaaa taaaagcaga atgtatatca 2520

tcccatctga aaaacactaa ttattgacat gtgcatctgt acaataaact taaaatgatt 2580

attaaataat caaatatatc tactacattg tttatattat tgaataaagt atattttcca 2640

aatgt 2645

<210> 39
<211> 1433
<212> DNA
<213> Homo sapiens

<400> 39
attcggggcg agggaggagg aagaagcgga ggaggcggct cccgctcgca gggccgtgca 60

cctgcccgcc cgcccgctcg ctcgctcgcc cgccgcgccg cgctgccgac cgccagcatg 120

ctgccgagag tgggctgccc cgcgctgccg ctgccgccgc cgccgctgct gccgctgctg 180

ccgctgctgc tgctgctact gggcgcgagt ggcggcggcg gcggggcgcg cgcggaggtg 240

ctgttccgct gcccgccctg cacacccgag cgcctggccg cctgcgggcc cccgccggtt 300

gcgccgcccg ccgcggtggc cgcagtggcc ggaggcgccc gcatgccatg cgcggagctc 360

gtccgggagc cgggctgcgg ctgctgctcg gtgtgcgccc ggctggaggg cgaggcgtgc 420

ggcgtctaca ccccgcgctg cggccagggg ctgcgctgct atccccaccc gggctccgag 480

ctgcccctgc aggcgctggt catgggcgag ggcacttgtg agaagcgccg ggacgccgag 540

tatggcgcca gcccggagca ggttgcagac aatggcgatg accactcaga aggaggcctg 600

gtggagaacc acgtggacag caccatgaac atgttgggcg ggggaggcag tgctggccgg 660

aagcccctca agtcgggtat gaaggagctg gccgtgttcc gggagaaggt cactgagcag 720

caccggcaga tgggcaaggg tggcaagcat caccttggcc tggaggagcc caagaagctg 780

cgaccacccc ctgccaggac tccctgccaa caggaactgg accaggtcct ggagcggatc 840

tccaccatgc gccttccgga tgagcggggc cctctggagc acctctactc cctgcacatc 900

cccaactgtg acaagcatgg cctgtacaac ctcaaacagt gcaagatgtc tctgaacggg 960

cagcgtgggg agtgctggtg tgtgaacccc aacaccggga agctgatcca gggagccccc 1020

accatccggg gggaccccga gtgtcatctc ttctacaatg agcagcagga ggcttgcggg 1080

gtgcacaccc agcggatgca gtagaccgca gccagccggt gcctggcgcc cctgcccccc 1140

gcccctctcc aaacaccggc agaaaacgga gagtgcttgg gtggtgggtg ctggaggatt 1200

ttccagttct gacacacgta tttatatttg gaaagagacc agcaccgagc tcggcacctc 1260

cccggcctct ctcttcccag ctgcagatgc cacacctgct ccttcttgct ttccccgggg 1320

gaggaagggg gttgtggtcg gggagctggg gtacaggttt ggggaggggg aagagaaatt 1380

tttatttttg aacccctgtg tcccttttgc ataagattaa aggaaggaaa agt 1433

<210> 40
<211> 1203
<212> DNA
<213> Homo sapiens

<400> 40
gatctggggt gctgccagga aaaagcaaat tctggaagtt aatggttttg agtgattttt 60

aaatccttgc tggcggagag gcccgcctct ccccggtatc agcgcttcct cattctttga 120

atccgcggct ccgcggtctt cggcgtcaga ccagccggag gaagcctgtt tgcaatttaa 180

gcgggctgtg aacgcccagg gccggcgggg gcggggccga ggcgggccat tttgaataaa 240

gaggcgtgcc ttccaggcag gctctataag tgaccgccgc ggcgagcgtg cgcgcgttgc 300

aggtcactgt agcggacttc ttttggtttt ctttctcttt ggggcacctc tggactcact 360

ccccagcatg aaggcgctga gcccggtgcg cggctgctac gaggcggtgt gctgcctgtc 420

ggaacgcagt ctggccatcg cccggggccg agggaagggc ccggcagctg aggagccgct 480

gagcttgctg gacgacatga accactgcta ctcccgcctg cgggaactgg tacccggagt 540

cccgagaggc actcagctta gccaggtgga aatcctacag cgcgtcatcg actacattct 600

cgacctgcag gtagtcctgg ccgagccagc ccctggaccc cctgatggcc cccaccttcc 660

catccagaca gccgagctcg ctccggaact tgtcatctcc aacgacaaaa ggagcttttg 720

ccactgactc ggccgtgtcc tgacacctcc agaacgcagg tgctggcgcc cgttctgcct 780

gggaccccgg gaacctctcc tgccggaagc cggacggcag ggatgggccc caacttcgcc 840

ctgcccactt gacttcacca aatcccttcc tggagactaa acctggtgct caggagcgaa 900

ggactgtgaa cttgtagcct gaagagccag agctagctct ggccaccagc tgggcgacgt 960

caccctgctc ccaccccacc cccaagttct aaggtctttt cagagcgtgg aggtgtggaa 1020

ggagtggctg ctctccaaac tatgccaagg cggcggcaga gctggtcttc tggtctcctt 1080

ggagaaaggt tctgttgccc tgatttatga actctataat agagtatata ggttttgtac 1140

ctttttttaca ggaaggtgac tttctgtaac aatgcgatgt atattaaact ttttataaaa 1200

gtt 1203

<210> 41
<211> 1116
<212> DNA
<213> Homo sapiens

<400> 41
ctgaggctgc cttgggaaga agatgatcct aaacaaagct ctgctgctgg gggccctcgc 60

tctgaccacc gtgatgagcc cctgtggagg tgaagacatt gtggctgacc acgttgcctc 120

ttgtggtgta aacttgtacc agttttacgg tccctctggc cagtacaccc atgaatttga 180

tggagatgag cagttctacg tggacctgga gaggaaggag actgcctggc ggtggcctga 240

gttcagcaaa tttggaggtt ttgacccgca gggtgcactg agaaacatgg ctgtggcaaa 300

acacaacttg aacatcatga ttaaacgcta caactctacc gctgctacca atgaggttcc 360

tgaggtcaca gtgttttcca agtctcccgt gacactgggt cagcccaaca ccctcatttg 420

tcttgtggac aacatctttc ctcctgtggt caacatcaca tggctgagca atgggcagtc 480

agtcacagaa gatgtttctg agaccagctt cctctccaag agtgatcatt ccttcttcaa 540

gatcagttac ctcaccttcc ttccctctgc tgatgagatt tatgactgca aggtggagca 600

ctggggcctg gaccagcctc ttctgaaaca ctgggagcct gagattccag cccctatgtc 660

agagctcaca gagactgtgg tctgtgccct ggggttgtct gtgggcctca tgggcattgt 720

ggtgggcact gtcttcatca tccaaggcct gcgttcagtt ggtgcttcca gacaccaagg 780

gccattgtga atcccatcct ggaagggaag gtgcatcgcc atctacagga gcagaagaat 840

ggacttgcta aatgacctag cactattctc tggcccggtt tatcatatcc cttttctcct 900

ccaaatattt ctcctctcac cttttctctg ggacttaagc tgctatatcc cctcagagct 960

cacaaatgcc tttacattct ttccctgacc tcctgatttt tttttctttt ctcaaatgtt 1020

acctacacag acatgcctgg ggtaagccac ccggctacct aattcctcag taacctccat 1080

ctaaaatctc caaggaagca ataaattcct tttatg 1116

<210> 42
<211> 554
<212> DNA
<213> Homo sapiens

<400> 42
gccagaaccg gtggagcagc gacccctgag cagtgttctc tgtgctgagc ggcgggactg 60

agctgttgag ttagagccaa catgagtgag cgacaaggtg ctggggcaac caatggaaaa 120

gacaagacat ctggtgaaaa tgatggacag aagaaagttc aagaagaatt tgacattgac 180

atggatgcac cagagacaga acgtgcagcg gtggccattc agtctcagtt cagaaaattc 240

cagaagaaga aggctgggtc tcagtcctag tgggagaacc ccctcctagt ccacctgaaa 300

acaccaaatt caaccatcat ctgtcaagaa attaaaagaa caacacccta gagagaagtc 360

atccacacac aatccacaca cgcatagcaa acctccaatg catgtacaga aacctgtgat 420

atttataccc ttgtaggaag gtatagacaa tggaattgtg agtagcttaa tctctatgtt 480

tctctccatt ttcattcctc ctgcaactat tttccttgat gttgtaataa aatgaagtta 540

cgatgagtga aaaa 554

<210> 43
<211> 1201
<212> DNA
<213> Homo sapiens

<400> 43
wttatwahaa atttattttt aacccaatag aaaagcaaat ttggaatcta tttacaagta 60

ctatatattt acatatatac agttagagtg ggagatttaa agaaaatggg cagagaaaca 120

caatataaat caaagaatat gccactgtac aaggcattat tatcattatc atggtcctta 180

atgttactga acctttacta tagtaataaa tacagttcta tatttacaca tcttataaaa 240

catctcataa atgtattttt tcaaatccaa gthaaaacat ctgatcaaaa taaacatgct 300

tatataaaaa taaatctacc taacagccat ttggtttgga tgtattgarg ctaatatagg 360

ataatagagg gtaagrbtta atactttgac ttttcttatt taataacttg cttcttaaaa 420

tacctaacac agtattaata tggaatargc rgagargtaa tgttcctaac atcaagtggg 480

ttatccagag agaacacagc taaaaccaag ctaaataaac aggataatac gttactgagt 540

ctcttgagtc caaagtggtg tcagatattg ggtttgccag agctactaga gatacatgtg 600

tgagaggttg tatcagtgga cttaatttat gtgatgtgca catttgatca ttaagatgca 660

catcagtttg aatcaactga taaaacttat tgcaaaaatt ctttactaac ccagaaaaaa 720

aatcccagat tgcttacttt cttttccagg tatgtycatt gctggcagtg gaattccctt 780

ctgagctttg ggcmcaagga gttaaaaaca aatcagataa gacatacgtc acctgtscat 840

gattscctta gtaacaattt aagaattttg gtcagttttt ctttcaaaat acttgtaagc 900

agttttatcc catgakggtg gaccatctag tgctgataca taaamctggt atctctaaaa 960

wtgatctcaa tatgagtgag taacaatacy twacattacc ayctaaggga ttgtscttag 1020

aaggatcttt cysmkkaags aaasgwggat haaaathtca awkktattwt attwatccaw 1080

ttwaaaychm haaaataaat ttttattwaa ccawatttcy aatcccmaaa ccyttttttt 1140

tttttaaaaa aattttatat tamcbkktcm tkyyktaaam dttttttaaa atttaaattw 1200

a 1201

<210> 44
<211> 2880
<212> DNA
<213> Homo sapiens

<400> 44
tgctgctctc cgcccgcgtc cggctcgtgg ccccctactt cgggcaccat ggacacctcc 60

cggctcggtg tgctcctgtc cttgcctgtg ctgctgcagc tggcgaccgg gggcagctct 120

cccaggtctg gtgtgttgct gaggggctgc cccacacact gtcattgcga gcccgacggc 180

aggatgttgc tcagggtgga ctgctccgac ctggggctct cggagctgcc ttccaacctc 240

agcgtcttca cctcctacct agacctcagt atgaacaaca tcagtcagct gctcccgaat 300

cccctgccca gtctccgctt cctggaggag ttacgtcttg cgggaaacgc tctgacatac 360

attcccaagg gagcattcac tggcctttac agtcttaaag ttcttatgct gcagaataat 420

cagctaagac acgtacccac agaagctctg cagaatttgc gaagccttca atccctgcgt 480

ctggatgcta accacatcag ctatgtgccc ccaagctgtt tcagtggcct gcattccctg 540

aggcacctgt ggctggatga caatgcgtta acagaaatcc ccgtccaggc ttttagaagt 600

ttatcggcat tgcaagccat gaccttggcc ctgaacaaaa tacaccacat accagactat 660

gcctttggaa acctctccag cttggtagtt ctacatctcc ataacaatag aatccactcc 720

ctgggaaaga aatgctttga tgggctccac agcctagaga ctttagattt aaattacaat 780

aaccttgatg aattccccac tgcaattagg acactctcca accttaaaga actaggattt 840

catagcaaca atatcaggtc gatacctgag aaagcatttg taggcaaccc ttctcttatt 900

acaatacatt tctatgacaa tcccatccaa tttgttggga gatctgcttt tcaacattta 960

cctgaactaa gaacactgac tctgaatggt gcctcacaaa taactgaatt tcctgattta 1020

actggaactg caaacctgga gagtctgact ttaactggag cacagatctc atctcttcct 1080

caaaccgtct gcaatcagtt acctaatctc caagtgctag atctgtctta caacctatta 1140

gaagatttac ccagtttttc agtctgccaa aagcttcaga aaattgacct aagacataat 1200

gaaatctacg aaattaaagt tgacactttc cagcagttgc ttagcctccg atcgctgaat 1260

ttggcttgga acaaaattgc tattattcac cccaatgcat tttccacttt gccatcccta 1320

ataaagctgg acctatcgtc caacctcctg tcgtcttttc ctataactgg gttacatggt 1380

ttaactcact taaaattaac aggaaatcat gccttacaga gcttgatatc atctgaaaac 1440

tttccagaac tcaaggttat agaaatgcct tatgcttacc agtgctgtgc atttggagtg 1500

tgtgagaatg cctataagat ttctaatcaa tggaataaag gtgacaacag cagtatggac 1560

gaccttcata agaaagatgc tggaatgttt caggctcaag atgaacgtga ccttgaagat 1620

ttcctgcttg actttgagga agacctgaaa gcccttcatt cagtgcagtg ttcaccttcc 1680

ccaggccccc tcaaaccctg tgaacacctg cttgatggct ggctgatcag aattggagtg 1740

tggaccatag cagttctggc acttacttgt aatgctttgg tgacttcaac agttttcaga 1800

tcccctctgt acatttcccc cattaaactg ttaattgggg tcatcgcagc agtgaacatg 1860
ctcacgggag tctccagtgc cgtgctggct ggtgtggatg cgttcacttt tggcagcttt 1920

gcacgacatg gtgcctggtg ggagaatggg gttggttgcc atgtcattgg ttttttgtcc 1980

atttttgctt cagaatcatc tgttttcctg cttactctgg cagccctgga gcgtgggttc 2040

tctgtgaaat attctgcaaa atttgaaacg aaagctccat tttctagcct gaaagtaatc 2100

attttgctct gtgccctgct ggccttgacc atggccgcag ttcctctgct gggtggcagc 2160

aagtatggcg cctcccctct ctgcctgcct ttgccttttg gggagcccag caccatgggc 2220

tacatggtcg ctctcatctt gctcaattcc ctttgcttcc tcatgatgac cattgcctac 2280

accaagctct actgcaattt ggacaaggga gacctggaga atatttggga ctgctctatg 2340

gtaaaacaca ttgccctgtt gctcttcacc aactgcatcc taaactgccc tgtggctttc 2400

ttgtccttct cctctttaat aaaccttaca tttatcagtc ctgaagtaat taagtttatc 2460

cttctggtgg tagtcccact tcctgcatgt ctcaatcccc ttctctacat cttgttcaat 2520

cctcacttta aggaggatct ggtgagcctg agaaagcaaa cctacgtctg gacaagatca 2580

aaacacccaa gcttgatgtc aattaactct gatgatgtcg aaaaacagtc ctgtgactca 2640

actcaagcct tggtaacctt taccagctcc agcatcactt atgacctgcc tcccagttcc 2700

gtgccatcac cagcttatcc agtgactgag agctgccatc tttcctctgt ggcatttgtc 2760

ccatgtctct aattaatatg tgaaggaaaa tgttttcaaa ggttgagaac ctgaaaatgt 2820

gagattgagt atatcagagc agtaattaat aagaagagct gaggtgaaac tcggtttaaa 2880

<210> 45
<211> 441
<212> DNA
<213> Homo sapiens

<400> 45
tttttgcctg gccggcctat tatttttat ttagagacgt ggtcttgcta tattgaccag 60

gctggtcttt aactcttggc ctcaatcaat cctcctacct cagcctccca aagtgctggg 120

attacaggcg tgagccacag cgcctgtcca cccttggcat tttgtagaca gcagcaattt 180

ccctcaaccc cagaatattt ggaatgttcc agaagtcctc atttacagtc gatcccacct 240

gtaccctata agtggtggtc ctgggcttga acttggacct gtctgaactc tgagctctta 300

acccctgagg taagaacctg gggtgagctc ttaacccatg ggaccaaccc ctctagagtg 360

aggagacacg tcatcatttt tccttgcagt attacatctg gaaaccgtgc cgtgatgatc 420

tctctgcacc cctcacaggc g 441

<210> 46
<211> 2583
<212> DNA
<213> Homo sapiens

<400> 46
gttcccactt cctcccgccc caggaaacct gccatggcct cctggtgagc tgtcctcatc 60

cactgctcgc tgcctctcca gatcttcagt tgcttcaggc cactttgaat gtatatgagc 120

cggtcgtagg ggatatcgat ggcttagctt gggctcagag gcctgaaaat cgcccccacc 180

aatcacctgt ttcccccaat ctaccctcct gaaggtcact gacaaagact tcattgtctc 240

ctaggagagg ctgccatata tcagggctga cgtaattcca tcttaatatc agttacatta 300

taaaaattta cctcgtgcct gaggccccag agcccaaggg tgcaaagcag taattagtca 360

aagttcaact tcccctccca ctctgggctc aggctgtccc tgagggcctg tgttttgagt 420

ctctttccag aaccttggtg tgaacttagg tcttggcgtc gggatccctt ttcgtcacac 480

tcaggtgacc tacaggctcc gctcgacact gcaaggctta gaccagttcg gtccaacaga 540

gaaagcaggc aaccaccatg tcatttgaaa acagtttcat cgggatataa ttcgcaaccc 600

atacagtgaa tccatttaag atactctgac ccatggatcc cctgggtgca gccaagccac 660

aatggccatg gcgccgctgt ctggccgcac tgctatttca gctgctggtg gctgtgtgtt 720

tcttctccta cctgcgtgtg tcccgagacg atgccactgg atcccctagg gctcccagtg 780

ggtcctcccg acaggacacc actcccaccc gccccaccct cctgatcctg ctatggacat 840

ggcctttcca catccctgtg gctctgtccc gctgttcaga gatggtgccc ggcacagccg 900

actgccacat cactgccgac cgcaaggtgt acccacaggc agacacggtc atcgtgcacc 960

actgggatat catgtccaac cctaagtcac gcctcccacc ttccccgagg ccgcaggggc 1020

agcgctggat ctggttcaac ttggagccac cccctaactg ccagcacctg gaagccctgg 1080

acagatactt caatctcacc atgtcctacc gcagcgactc cgacatcttc acgccctacg 1140

gctggctgga gccgtggtcc ggccagcctg cccacccacc gctcaacctc tcggccaaga 1200

ccgagctggt ggcctgggcg gtgtccaact ggaagccgga ctcagccagg gtgcgctact 1260

accagagcct gcaggctcat ctcaaggtgg acgtgtacgg acgctcccac aagcccctgc 1320

ccaaggggac catgatggag acgctgtccc ggtacaagtt ctacctggcc ttcgagaact 1380

ccttgcaccc cgactacatc accgagaagc tgtggaggaa cgccctggag gcctgggccg 1440

tgcccgtggt gctgggcccc agcagaagca actacgagag gttcctgcca cccgacgcct 1500

tcatccacgt ggacgacttc cagagcccca aggacctggc ccggtacctg caggagctgg 1560

acaaggacca cgcccgctac ctgagctact ttcgctggcg ggagacgctg cggcctcgct 1620

ccttcagctg ggcactggat ttctgcaagg cctgctggaa actgcagcag gaatccaggt 1680

accagacggt gcgcagcata gcggcttggt tcacctgaga ggccggcatg gtgcctgggc 1740

tgccgggaac ctcatctgcc tggggcctca cctgctggag tcctttgtgg ccaaccctct 1800

ctcttacctg ggacctcaca cgctgggctt cacggctgcc aggagcctct cccctccaga 1860

agacttgcct gctagggacc tcgcctgctg gggacctcgc ctgttgggga cctcacctgc 1920

tggggacctc acctgctggg gaccttggct gctggaggct gcacctactg aggatgtcgg 1980

cggtcgggga ctttacctgc tgggacctgc tcccagagac cttgccacac tgaatctcac 2040

ctgctgggga cctcaccctg gagggccctg ggccctgggg aactggctta cttggggccc 2100

cacccgggag tgatggttct ggctgatttg tttgtgatgt tgttagccgc ctgtgagggg 2160

tgcagagaga tcatcacggc acggtttcca gatgtaatac tgcaaggaaa aatgatgacg 2220

tgtctcctca ctctagaggg gttggtccca tgggttaaga gctcacccca ggttctcacc 2280

tcaggggtta agagctcaga gttcagacag gtccaagttc aagcccagga ccaccactta 2340

tagggtacag gtgggatcga ctgtaaatga ggacttctgg aacattccaa atattctggg 2400

gttgagggaa attgctgctg tctacaaaat gccaagggtg gacaggcgct gtggctcacg 2460

cctgtaattc cagcactttg ggaggctgag gtaggaggat tgattgaggc caagagttaa 2520

agaccagcct ggtcaatata gcaagaccac gtctctaaat aaaaaataat aggccggcca 2580

gca 2583

<210> 47
<211> 597
<212> DNA
<213> Homo sapiens

<400> 47
agctgaagtt gaggatctct tactctctaa gccacggaat taacccgagc aggcatggag 60

gcctctgctc tcacctcatc agcagtgacc agtgtggcca aagtggtcag ggtggcctct 120

ggctctgccg tagttttgcc cctggccagg attgctacag ttgtgattgg aggagttgtg 180

gccatggcgg ctgtgcccat ggtgctcagt gccatgggct tcactgcggc gggaatcgcc 240

tcgtcctcca tagcagccaa gatgatgtcc gcggcggcca ttgccaatgg gggtggagtt 300

gcctcgggca gccttgtggg tactctgcag tcactgggag caactggact ctccggattg 360

accaagttca tcctgggctc cattgggtct gccattgcgg ctgtcattgc gaggttctac 420

tagctccctg cccctcgccc tgcagagaag agaaccatgc caggggagaa ggcacccagc 480

catcctgacc cagcgaggag ccaactatcc caaatatacc tgggtgaaat ataccaaatt 540
ctgcatctcc agaggaaaat aagaaataaa gatgaattgt tgcaactctt aaaaaaa 597

<210> 48
<211> 2566
<212> DNA
<213> Homo sapiens

<400> 48
ggcacgagtt gtgctcctcg cttgcctgtt ccttttccac gcattttcca ggataactgt 60

gactccaggc ccgcaatgga tgccctgcaa ctagcaaatt cggcttttgc cgttgatctg 120

ttcaaacaac tatgtgaaaa ggagccactg ggcaatgtcc tcttctctcc aatctgtctc 180

tccacctctc tgtcacttgc tcaagtgggt gctaaaggtg acactgcaaa tgaaattgga 240

caggttcttc attttgaaaa tgtcaaagat atacccttg gatttcaaac agtaacatcg 300

gatgtaaaca aacttagttc cttttactca ctgaaactaa tcaagcggct ctacgtagac 360

aaatctctga atctttctac agagttcatc agctctacga agagacccta tgcaaaggaa 420

ttggaaactg ttgacttcaa agataaattg gaagaaacga aaggtcagat caacaactca 480

attaaggatc tcacagatgg ccactttgag aacattttag ctgacaacag tgtgaacgac 540

cagaccaaaa tccttgtggt taatgctgcc tactttgttg gcaagtggat gaagaaattt 600

cctgaatcag aaacaaaaga atgtcctttc agactcaaca agacagacac caaaccagtg 660

cagatgatga acatggaggc cacgttctgt atgggaaaca ttgacagtat caattgtaag 720

atcatagagc ttccttttca aaataagcat ctcagcatgt tcatcctact acccaaggat 780

gtggaggatg agtccacagg cttggagaag attgaaaaac aactcaactc agagtcactg 840

tcacagtgga ctaatcccag caccatggcc aatgccaagg tcaaactctc cattccaaaa 900

tttaaggtgg aaaagatgat tgatcccaag gcttgtctgg aaaatctagg gctgaaacat 960

atcttcagtg aagacacatc tgatttctct ggaatgtcag agaccaaggg agtggcccta 1020

tcaaatgtta tccacaaagt gtgcttagaa ataactgaag atggtgggga ttccatagag 1080

gtgccaggag cacggatcct gcagcacaag gatgaattga atgctgacca tccctttatt 1140

tacatcatca ggcacaacaa aactcgaaac atcattttct ttggcaaatt ctgttctcct 1200

taagtggcat agcccatgtt aagtcctccc tgacttttct gtggatgccg atttctgtaa 1260

actctgcatc cagagattca ttttctagat acaataaatt gctaatgttg ctggatcagg 1320

aagccgccag tacttgtcat atgtagcctt cacacagata gacctttttt tttttccaat 1380

tctatctttt gtttcctttt ttcccataag acaatgacat acgcttttaa tgaaaaggaa 1440

tcacgttaga ggaaaaatat ttattcatta tttgtcaaat tgtccggggt agttggcaga 1500
aatacagtct tccacaaaga aaattcctat aaggaagatt tggaagctct tcttcccagc 1560

actatgcttt ccttctttgg gatagagaat gttccagaca ttctcgcttc cctgaaagac 1620

tgaagaaagt gtagtgcatg ggacccacga aactgccctg gctccagtga aacttgggca 1680

catgctcagg ctactatagg tccagaagtc cttatgttaa gccctggcag gcaggtgttt 1740

attaaaattc tgaattttgg ggattttcaa aagataatat tttacataca ctgtatgtta 1800

tagaacttca tggatcagat ctggggcagc aacctataaa tcaacacctt aatatgctgc 1860

aacaaaatgt agaatattca gacaaaatgg atacataaag actaagtagc ccataagggg 1920

tcaaaatttg ctgccaaatg cgtatgccac caacttacaa aaacacttcg ttcgcagagc 1980

ttttcagatt gtggaatgtt ggataaggaa ttatagacct ctagtagctg aaatgcaaga 2040

ccccaagagg aagttcagat cttaatataa attcactttc atttttgata gctgtcccat 2100

ctggtcatgt ggttggcact agactggtgg caggggcttc tagctgactc gcacagggat 2160

tctcacaata gccgatatca gaatttgtgt tgaaggaact tgtctcttca tctaatatga 2220

tagcgggaaa aggagaggaa actactgcct ttagaaaata taagtaaagt gattaaagtg 2280

ctcacgttac cttgacacat agtttttcag tctatgggtt tagttacttt agatggcaag 2340

catgtaactt atattaatag taatttgtaa agttgggtgg ataagctatc cctgttgccg 2400

gttcatggat tacttctcta taaaaaatat atatttacca aaaaattttg tgacattcct 2460

tctcccatct cttccttgac atgcattgta aataggttct tcttgttctg agattcaata 2520

ttgaatttct cctatgctat tgacaataaa atattattga actacc 2566

<210> 49
<211> 484
<212> DNA
<213> Homo sapiens

<400> 49
ccgttcgctc cggacaccat ggacaagttt tggtggcacg cagcctgggg actctgcctc 60

gtgccgctga gcctggcgca gatcgatttg aatataacct gccgctttgc aggtgtattc 120

cacgtggaga aaaatggtcg ctacagcatc tctcggacgg aggccgctga cctctgcaag 180

gctttcaata gcaccttgcc cacaatggcc cagatggaga aagctctgag catcggattt 240

gagacctgca gtttgcattg cagtcaacag tcgaagaagg tgtgggcaga agaaaaagct 300

agtgatcaac agtggcaatg gagctgtgga ggacagaaag ccaagtggac tcaacggaga 360

ggccagcaag tctcaggaaa tggtgcattt ggtgaacaag gagtcgtcag aaactccaga 420

ccagtttatg acagctgatg agacaaggaa cctgcagaat gtggacatga agattggggt 480

gtaa 484

<210> 50
<211> 4211
<212> DNA
<213> Homo sapiens

<400> 50
gccggctgtg cagtagaacg gggatcgaaa agaggaaaac aagggcacga agaccagcga 60

gaaagaagag gacacctggg aaaggcggaa gcagaagacg gggaagggaa aagaaaccca 120

tagcaggtgg aaaccagatc tagagcaaca ccgtcaggtt cacagtttgt ttttctagaa 180

gagaagaaag tacctgagga ttgctctttt ttcctaccgt taatgaaaac tacttttgtc 240

ttcatcataa aagaaaaaac taaggggagg taaaggcagt ctcctgtttt attaggggga 300

gaggtgaagg gaaatccagg ctcactttct gaataagcca ctgcctggtg cacagagcag 360

aaccatcctg gtttctgaag acacatccct ttcagcagaa ttccagccgg agtcgctggc 420

acagttctat ttttatattt aaatgtatgt ctcccctggc ctttttttct ttttttttct 480

ttttttagca acacttttct tgtttgtaaa cgcgagtgac cagaaagtgt gaatgcggag 540

taggaatatt tttcgtgttc tcttttatct gcttgccttt tttagagagt agcagtggtt 600

cctatttcgg aaaaggacgt tctaattcaa agctctctcc caatatattt acacgaatac 660

gcatttagaa agggaggcag cttttgaggt tgcaatccta ctgagaagga tggaagaagg 720

agccaggcac cgaaacaaca ccgaaaagaa acacccaggt gggggcgagt cggacgccag 780

ccccgaggct ggttccggag ggggcggagt agccctgaag aaagagatcg gattggtcag 840

tgcctgtggt atcatcgtag ggaacatcat cggctctgga atctttgtct cgccaaaggg 900

agtgctggag aatgctggtt ctgtgggcct tgctctcatc gtctggattg tgacgggctt 960

catcacagtt gtgggagccc tctgctatgc tgaactcggg gtcaccatcc ccaaatctgg 1020

aggtgactac tcctatgtca aggacatctt cggaggactg gctgggttcc tgaggctgtg 1080

gattgctgtg ctggtgatct accccaccaa ccaggctgtc atcgccctca ccttctccaa 1140

ctacgtgctg cagccgctct tccccacctg cttcccccca gagtctggcc ttcggctcct 1200

ggctgccatc tgcttattgc tcctcacatg ggtcaactgt tccagtgtgc ggtgggccac 1260

ccgggttcaa gacatcttca cagctgggaa gctcctggcc ttggccctga ttatcatcat 1320

ggggattgta cagatatgca aaggagagta cttctggctg gagccaaaga atgcatttga 1380

gaatttccag gaacctgaca tcggcctcgt cgcactggct ttccttcagg gctcctttgc 1440

ctatggaggc tggaactttc tgaattacgt gactgaggag cttgttgatc cctacaagaa 1500

ccttcccaga gccatcttca tctccatccc actggtcaca tttgtgtatg tctttgccaa 1560

tgtcgcttat gtcactgcaa tgtcccccca ggagctgctg gcatccaacg ccgtcgctgt 1620

gacttttgga gagaagctcc taggagtcat ggcctggatc atgcccattt ctgttgccct 1680

gtccacattt ggaggagtta atgggtctct cttcacctcc tctcggctgt tcttcgctgg 1740

agcccgagag ggccaccttc ccagtgtgtt ggccatgatc cacgtgaagc gctgcacccc 1800

aatcccagcc ctgctcttca catgcatctc caccctgctg atgctggtca ccagcgacat 1860

gtacacactc atcaactacg tgggcttcat caactacctc ttctatgggg tcacggttgc 1920

tggacagata gtccttcgct ggaagaagcc tgatatcccc cgccccatca agatcaacct 1980

gctgttcccc atcatctact tgctgttctg ggccttcctg ctggtcttca gcctgtggtc 2040

agagccggtg gtgtgtggca ttggcctggc catcatgctg acaggagtgc ctgtctattt 2100

cctgggtgtt tactggcaac acaagcccaa gtgtttcagt gacttcattg agctgctaac 2160

cctggtgagc cagaagatgt gtgtggtcgt gtaccccgag gtggagcggg gctcagggac 2220

agaggaggct aatgaggaca tggaggagca gcagcagccc atgtaccaac ccactcccac 2280

gaaggacaag gacgtggcgg ggcagcccca gccctgagga ccaccattcc ctggctactc 2340

tctccttcct ccccctttta tcctacctcc ctgccttggt cccgccaaca catgcgagta 2400

cacacacacc cctctctctg cttttgtcag gcagtggtag gactttggtg tgggtggtgt 2460

gagaaattgt aaacaaaaac tgacattcat acccaaagaa ccagcctctc accccagggt 2520

ccatgtccca ggccccactc cagtgctgcc cacactccca gctgctggag gagaggggag 2580

atgccaaggt gccctgcagg acctccctcc gggccacacc ctcagctgcc tcttcaggaa 2640

ccggagctca ttactgcctt ccctcccagg gaggcccctt cagagaggag aggccacagg 2700

agctgcattg tgggggaca ggctcaagca attctgtccc catcaagggg tcagctggag 2760

agacccaaga ccctatctgt tcaccaggga cccaaaatcc aaggggatgc ttccctctgc 2820

cctctttcct gcccctcccc atcatacctg cacccacccc agccagggct ccctgtccag 2880

aattcggttc tcctcaggac gccaactccc agagctaagg accaaggaga agaacagcct 2940

ctccaccccc aagccaggcg gttgaggaac atattgagaa aggttcagat tgcagaaacc 3000

cagccctgcc cctgcctcct gcatccagcc cccaacatgg tgccaaagct tccagaagcc 3060

aaaaagcttc tgatttttaa ggtagtgggc atctctctcc taatgacgaa gctgctcagc 3120

aactccacct gcccgccgca ggaaggagca gtcccctgct atccctgcag ccactcccag 3180

cacacccgca cacagccagc accaccgccc ccaccgtgca cttctcctct ctgggccttg 3240

gcttgggacc aggtacgaag gatccccaag cccttcaggc ctgagatcag agccagatca 3300

gccttaagtc acctcccatc caagaacttg gcctaaaaat actcccctat ttctaaccct 3360

caggacggat ctgatattaa atgccttccc tgggaggaag ggtgctttcc ccctccctag 3420

aggtgcccat tccataccct gggagactga ggagagcatt ggctgaagcc cagttccttt 3480

cccatccatc cccaactcca ataatccccc actcctcgca ggtctcagtg tcatgctgtc 3540

ttggggcagg gtgaaagggt agtggcagca gggcgcccac tctggagatc ctcaaaaaag 3600

gccctcctct gtggctggca gcctctgacc tttccctggg cttcaaagga aggctatgga 3660

gtttgctgtg ggccctgcaa ccttcccagc cactcctgct gcactaagga cttaggatcc 3720

ttttatcaca aatcgggatt ctctcccccа ccccgaattc tgtctgctta aactggaata 3780

cacaggagcc cttcctggcc tggatggtgt ctcccagctt ccccgcccag cttgcccacc 3840

ccatagttgg tgagatgcca agtttggtct gagttgtgac cccttcagag tagatgcccg 3900

gcaggctggg gttggccccт ggagggtcag gggaccatct tcttattccc tcttttctca 3960

ttcctccaac ttcctccccт ccttcaatta ttttttttgta aagttgatgc cttacttttt 4020

ggataaatat ttttgaagct ggtatttcta tttcttttgg attttttttа atgtaaggtt 4080

gttttggggg atggagttag aaccttaatg ataatttctt tcgtttggtg taggttttag 4140

agatttgttt tgtggagagg ttttttttctt ttgatgtaat aaaatttaaa atggaaaaaa 4200

aaaaaaaaaa a 4211

<210> 51
<211> 1952
<212> DNA
<213> Homo sapiens

<400> 51
ggcacgaggc ttgcgttcca gtgttccagc ttctgcgaga tgaccctcaa ggcgagcgag 60

ggcgagagtg ggggcagcat gcacacggcg ctctccgacc tctacctgga gcatttgctg 120

cagaagcgta gtcggccaga ggctgtatcg catccattga atactgtgac cgaggacatg 180

tacaccaacg ggtctcctgc cccaggtagc cctgcccagg tcaagggaca ggaggtgcgg 240

aaagtgcgac tcatacagtt tgagaaggtc acagaagagc ccatgggaat cacgctgaag 300

ctgaatgaaa aacagtcctg tacggtggcc agaattcttc atggtggcat gatccataga 360

caaggctccc ttcacgtggg ggatgagatc ctagaaatca atggcacaaa tgtgacaaat 420

cattcagtgg atcagctgca gaaggcgatg aaagaaacca aaggaatgat ctcattaaaa 480

gtaattccca accagcaaag ccgtcttcct gcactacaga tgttcatgag agcgcagttt 540

gactatgatc ccaaaaagga caatctgatc ccttgcaagg aggcgggact gaagtttgct 600

actggggaca ttatccagat tatcaacaag gatgacagca attggtggca gggacgggtg 660

gaaggctcct ccaaggagtc agcaggattg atcccttccc ctgagctgca ggaatggcga 720

gtggcaagta tggctcagtc agctcctagc gaagccccga gctgcagtcc ctttgggaag 780

aagaagaagt acaaagacaa atatctggcc aagcacagct cgatttttga tcagttggat 840

gttgtttcct acgaggaagt cgttcggctc cctgcattca agaggaagac cctggtgctg 900

atcggagcca gtggggtggg tcgcagccac attaagaatg ccctgctcag ccagaatccg 960

gagaagtttg tgtaccctgt cccatataca acacggccgc caaggaagag tgaggaagat 1020

gggaaggagt accactttat ctcaacggag gagatgacga ggaacatctc tgccaatgag 1080

ttcttggagt ttggcagcta ccaaggcaac atgtttggca ccaaatttga aacagtgcac 1140

cagatccata agcagaacaa gattgccatc cttgacattg agccccagac cctgaaaatt 1200

gttcggacag cagaactttc gcctttcatt gtgttcattg cacctactga ccagggcact 1260

cagacagaag ccctgcagca gctgcagaag gactctgagg ccatccgcag ccagtacgct 1320

cactactttg acctctcact ggtcaataat ggtgttgatg aaacccttaa gaaattacaa 1380

gaagccttcg accaagcgtg cagttctcca cagtgggtgc ctgtctcctg ggtttactaa 1440

gcttgtagaa tgggggaacc cactgtatgc ccctctccag catttggaat tccacccgcc 1500

ttgctttaag acaaacaggg ctgctccaac tagttttgtg tcagcttcca gctctctgca 1560

gctatcctaa ttcagccagt aaggttcagt cttcttgctc aggctcctga agggttgatt 1620

ctcctgatag atggggcccc actgatctgg atttgaaaag gatttctaga aattgggggt 1680

aagaagtact accaaaatgt aactgctaat caagggtgat gcacagcaaa agcaatggac 1740

cccatccctc taaagcctgc cctcctttgc cttcaactgt atatgctggg tatttcattt 1800

gtctttttat tttggagaaa gcgtttttaa ctgcaacttt ctataatgcc aaaatgacac 1860

atctgtgcaa tagaatgatg tctgctctag ggaaaccttc aaaagcaata aaaatgctgt 1920

gttgaaatgc caaaaaaaaa aaaaaaaaaa aa 1952

<210> 52
<211> 1760
<212> DNA
<213> Homo sapiens

<400> 52
gtcgaccctt tccacccctg gaagatggaa ataaacctgc gtgtgggtgg agtgttagga 60

caaaaaaaaa aaaaaaaaag tctagagcca ccgtccaggg agcaggtagc tgctgggctc 120

cggggacact ttgcgttcgg gctgggagcg tgctttccac gacggtgaca cgcttccctg 180

gattggcagc cagactgcct tccgggtcac tgccatggag gagccgcagt cagatcctag 240

cgtcgagccc cctctgagtc aggaaacatt ttcagaccta tggaaactac ttcctgaaaa 300

caacgttctg tccccttgc cgtcccaagc aatggatgat ttgatgctgt ccccggacga 360

tattgaacaa tggttcactg aagacccagg tccagatgaa gctcccagaa tgccagaggc 420

tgctcccccc gtggcccctg caccagcagc tcctacaccg gcggcccctg caccagcccc 480

ctcctggccc ctgtcatctt ctgtcccttc ccagaaaacc taccagggca gctacggttt 540

ccgtctgggc ttcttgcatt ctgggacagc caagtctgtg acttgcacgt actcccctgc 600

cctcaacaag atgttttgcc aactggccaa gacctgccct gtgcagctgt gggttgattc 660

cacacccccg cccggcaccc gcgtccgcgc catggccatc tacaagcagt cacagcacat 720

gacggaggtt gtgaggcgct gccccccacca tgagcgctgc tcagatagcg atggtctggc 780

ccctcctcag catcttatcc gagtggaagg aaatttgcgt gtggagtatt tggatgacag 840

aaacactttt cgacatagtg tggtggtgcc ctatgagccg cctgaggttg gctctgactg 900

taccaccatc cactacaact acatgtgtaa cagttcctgc atgggcggca tgaaccggag 960

gcccatcctc accatcatca cactggaaga ctccagtggt aatctactgg gacggaacag 1020

ctttgaggtg catgtttgtg cctgtcctgg gagagaccgg cgcacagagg aagagaatct 1080

ccgcaagaaa ggggagcctc accacgagct gcccccaggg agcactaagc gagcactgcc 1140

caacaacacc agctcctctc cccagccaaa gaagaaacca ctggatggag aatatttcac 1200

ccttcagatc cgtgggcgtg agcgcttcga gatgttccga gagctgaatg aggccttgga 1260

actcaaggat gcccaggctg ggaaggagcc agggggggagc agggctcact ccagccacct 1320

gaagtccaaa aagggtcagt ctacctcccg ccataaaaaa ctcatgttca agacagaagg 1380

gcctgactca gactgacatt ctccacttct tgttccccac tgacagcctc ccacccccat 1440

ctctccctcc cctgccattt tgggttttgg gtctttgaac ccttgcttgc aataggtgtg 1500

cgtcagaagc acccaggact tccatttgct ttgtcccggg gctccactga acaagttggc 1560

ctgcactggt gttttgttgt ggggaggagg atggggagta ggacatacca gcttagattt 1620

taaggttttt actgtgaggg atgtttggga gatgtaagaa atgttcttgc agttaagggt 1680

tagtttacaa tcagccacat tctaggtagg gacccacttc accgtactaa ccagggaagc 1740

tgtccctcac tgttgaattc 1760

<210> 53
<211> 439
<212> DNA
<213> Homo sapiens

<400> 53
ggtgggtctg aatctagcac catgacggaa ctagagacag ccatgggcat gatcatagac 60

gtcttttccc gatattcggg cagcgagggc agcacgcaga ccctgaccaa gggggagctc 120

aaggtgctga tggagaagga gctaccaggc ttcctgcaga gtggaaaaga caaggatgcc 180

gtggataaat tgctcaagga cctggacgcc aatggagatg cccaggtgga cttcagtgag 240

ttcatcgtgt tcgtggctgc aatcacgtct gcctgtcaca agtactttga gaaggcagga 300

ctcaaatgat gccctggaga tgtcacagat tcctgcagag ccatggtccc aggcttccca 360

aaagtgtttg ttggcaatta ttcccctagg ctgagcctgc tcatgtacct ctgattaata 420

aatgcttatg aaaaaaaaa 439

<210> 54
<211> 1564
<212> DNA
<213> Homo sapiens

<400> 54
gttttagcat actccctggc agagagaagt cagtcaataa atgtttgcta aataaagaat 60

gatgtgatgt attaatggta ttaatattaa agaaggtata tatcatcata cacatatgct 120

cataaaataa tgactcaaac ttccaattct gtatgcagaa gctaatcacc tccattgttt 180

tttacttaaa aaagggagac atttttagtc ttcacaataa tcatgtatag attggggatg 240

aaataattta agtttcctac tatatataaa gccactgagc agtaactttt ttatttcata 300

aaaatcataa ttttttttaat cattaagtat ccctttgtat ccaccacctt ttagaaagtc 360

tatttaccta cacacctatc ctctgagaat tgtatgtcct gtatcattcc ccttccataa 420

aaattgggcc tgaaagccat gttttatgaa cctttggctt catcggccac agttgattag 480

accagaaaga gatacctgcc tcagactcaa ttttctccca gaggttcaga atgaaatcac 540

agaaccatga gcgaatatat gaatttaaga gttagaagac atgtccatcc acgtgcagtg 600

gtgaaagaca acatgcaaag taagaaaaat gaagtggaaa agcaggaaga ctcagagaaa 660

tcatgctacc ccagggtagt aagaaaatag ctgcatgggg ctgggcacgg tggcctgtaa 720

tcccagcaag ttggaaggac gaggcaggag gatcacttga ggccaggagt tcgaggccag 780

cctggacaac acggtgaaac cccatctcta ctaaaaatac aaaaatgagc cagccatggt 840
ggcatgtgcc tgtaatccca gctactcagg aggctgaggc aggagaatca cctgaacccg 900

ggaagcggag gatgctgtga gctgagatag caccactgca ctccagcctg ggcgacagag 960

taagacgctg tctcaaaata aagaaagaaa aaaagaaaat agctgcctgg gttataaatt 1020

tccagttcct ggtttccctt ccccttcatg agtcttggct gtacttctat catcgggtac 1080

tgtgaaaact ccagcatctt tgcctaatgg gaactaattt ccctttttgg gtaagccagc 1140

ttacattttt taaattgtcc attactggaa cctatgatct gaagagcgtc ctgggtcaac 1200

tgggcatcac taaggtcttc agcaatgggg ctgacctctc cggggtcaca gaggaggcac 1260

ccctgaagct ctccaaggcc gtgcataagg ctgtgctgac catcgacgag aaagggactg 1320

aagctgctgg ggccatgttt ttagaggcca tacccatgtc tatccccccc gaggtcaagt 1380

tcaacaaacc ctttgtcttc ttaatgattg aacaaaatac caagtctccc ctcttcatgg 1440

gaaaagtggt gaatcccacc caaaaataac tgcctctcgc tcctcaaccc ctcccctcca 1500

tccctggccc cctccctgga tgacattaaa gaagggttga gctggaaaaa aaaaaaaaaa 1560

aaaa 1564

<210> 55
<211> 1290
<212> DNA
<213> Homo sapiens

<400> 55
gcggcggcgg cggtagaggc ggcggcggcg gcggcagcgg gctcggaggc agcggttggg 60

ctcgcggcga gcggacgggg tcgagtcagt gcgttcgcgc gagttggaat cgaagcctct 120

taaaatggca gatgacttgg acttcgagac aggagatgca ggggcctcag ccaccttccc 180

aatgcagtgc tcagcattac gtaagaatgg ctttgtggtg ctcaaaggcc ggccatgtaa 240

gatcgtcgag atgtctactt cgaagactgg caagcacggc cacgccaagg tccatctggt 300

tggtattgac atctttactg ggaagaaata tgaagatatc tgcccgtcaa ctcataatat 360

ggatgtcccc aacatcaaaa ggaatgactt ccagctgatt ggcatccagg atgggtacct 420

atcactgctc caggacagcg gggaggtacg agaggacctt cgtctccctg agggagacct 480

tggcaaggag attgagcaga agtacgactg tggagaagag atcctgatca cggtgctgtc 540

tgccatgaca gaggaggcag ctgttgcaat caaggccatg gcaaaataac tggctcccag 600

gatggcggtg gtggcagcag tgatcctctg aacctgcaga ggccccctcc ccgagcctgg 660

cctggctctg gcccggtcct aagctggact cctcctacac aatttatttg acgttttatt 720

ttggttttcc ccacccctc aatctgtcgg ggagcccctg cccttcacct agctcccttg 780
gccaggagcg agcgaagctg tggccttggt gaagctgccc tcctcttctc ccctcacact 840

acagccctgg tgggggagaa gggggtgggt gctgcttgtg gtttagtctt ttttttttt 900

ttttttttt ttttaaattc aatctggaat cagaaagcgg tggattctgg caaatggtcc 960

ttgtgccctc cccactcatc cctggtctgg tcccctgttg cccatagccc tttaccctga 1020

gcaccacccc aacagactgg ggaccagccc cctcgcctgc ctgtgtctct ccccaaaccc 1080

ctttagatgg ggagggaaga ggaggagagg ggaggggacc tgccccctcc tcaggcatct 1140

gggagggccc tgcccccatg ggctttaccc ttccctgcgg gctctctccc cgacacattt 1200

gttaaaatca aacctgaata aaactacaag tttaatatga aaaaaaaaaa aaaaaaaaaa 1260

aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1290

<210> 56
<211> 1821
<212> DNA
<213> Homo sapiens

<400> 56
aaaaatacaa aaattagccg gcatggtggc gcacgcctgt agtctcagct agtcaggagg 60

ctaaggcagg agaatcactt gaacctcgga ggcggaggtt gcagtgagtc gcaaacgcac 120

cactgcactc cagcctgggt gaaagagcga gactctgtct caaaacaaaa caaaacaaaa 180

aacctaacaa aaacaatagc taccatttac tagacactca ctacatacca ggcactgtgc 240

caaacagctc cttcttatca gctcagggtg ctgggggtgc cagggaggga aggtcagtga 300

aactgtggca ggtgtcggtt aagcaaaaga aggctggcat ctgtgcagct gggggcaggc 360

cttccctcct ccaacccccc tggccaggag catcacaggg caggcctgag cttccacaag 420

gtgacccagc cagtcaccat gaggcaggcc ccaggcgcca ggccactctg cagaggagcc 480

acgcaggagg tgacctttcc tatcttgact gaaacgggca cctggcgtgg aggccaagtc 540

tggagccagc cccctaggag agctccagga ggcagacatg cctgcggggt caaagcctgc 600

cagctgactg ctgtgccctc ctcaggaccc tgctccagca gctgcagaaa ctccagactc 660

tggtcaccaa caagatctcc agaccttaca agatggccgc cacccagact gggacctgcc 720

tcatggtggc agccttgtgc tttgttctgg tgctgggctc cctcgtgccc tgccttcccg 780

agttctcctc cggctcccag actgtgaagg aagacccccc ggccgcagac ggcgtctaca 840

cggccagcca gatgccctcc cgaagcctcc tattctacga tgacggggca ggcttatggg 900

aagatggccg cagcaccctg ctgcccatgg agcccccaga tggctgggaa atcaaccccg 960

gggggccggc agagcagcgg ccccgggacc acctgcagca tgatcacctg gacagcaccc 1020
acgagaccac caagtacctg agtgaggcct ggcctaaaga cggtggaaac ggcaccagcc 1080

ccgacttctc ccactccaag gagtggttcc acgacaggga tctgggcccc aacaccacca 1140

tcaaactctc ctaggccatg ccaagaccca ggacatagga cggacccctg gtacccagaa 1200

gaggagttct tgctcactaa cccggatccg cctcgtgccc ctgcctcctg gagcttccca 1260

ttccaggaga aaaggctcca cttcccagcc cttccttgcc cctgacattt ggactcttcc 1320

cttgggccga ccactctgtt ctcattctcc ttcccaccaa catccatccg tccttctcag 1380

acaaaccact cactgggtac cccacctcct ctctcatatg cccaacacga ccactgcctc 1440

cctgccccca cacctgcacc caaacagaca catcaacgca ccccactcac agacacccct 1500

taccccaccc ccactgtaca gagaccaaga acagaaattg tttgtaaata atgaacctta 1560

ttttttatta ttgccaatcc cctaagatat tgtattttac aaatctccct cttcccttcg 1620

cccctccctt gttttatatt ttatgaagtt agtgcgggct ttgctgctcc ctggcccagg 1680

aaagagggac tacctgaccc tcacctggca ccccccctgct gctgcccaag ccgctgggcc 1740

tttttaattg ccaaactgct ctcttcatca gctcagcaca tgctttaaga aagcaaaacc 1800

aaaaaaaaaa aaaaaaaaaa a 1821

<210> 57
<211> 2370
<212> DNA
<213> Homo sapiens

<400> 57
ccccgcccgt ttgccagcgc tcaggcagga gctctggact gggcgcgccg ccgccctgga 60

gtgagggaag cccagtggaa gggggtcccg ggagccggct gcgatggacg ccgtcttgga 120

acccttcccg gccgacaggc tgttccccgg atccagcttc ctggacttgg gggatctgaa 180

cgagtcggac ttcctcaaca atgcgcactt tcctgagcac ctggaccact ttacggagaa 240

catggaggac ttctccaatg acctgttcag cagcttcttt gatgaccctg tgctggatga 300

gaagagccct ctattggaca tggaactgga ctcccctacg ccaggcatcc aggcggagca 360

cagctactcc ctgagcggcg actcagcgcc ccagagcccc cttgtgccca tcaagatgga 420

ggacaccacc caagatgcag agcatggagc atgggcgctg ggacacaaac tgtgctccat 480

catggtgaag caggagcaga gcccggagct gcccgtggac cctctggctg ccccctcggc 540

catggctgcc gcggccgcca tggccaccac cccgctgctg ggcctcagcc ccttgtccag 600

gctgcccatc ccccaccagg ccccgggaga gatgactcag ctgccagtga tcaaagcaga 660

gcctctggag gtgaaccagt tcctcaaagt gacaccggag gacctggtgc agatgcctcc 720
gacgcccccc agcagccatg gcagtgacag cgacggctcc cagagtcccc gctctctgcc 780

cccctccagc cctgtcaggc ccatggcgcg ctcctccacg gccatctcca cctccccact 840

cctcactgcc cctcacaaat tacaggggac atcagggcca ctgctcctga cagaggagga 900

gaagcggacc ctgattgctg agggctaccc catccccaca aaactccccc tcaccaaagc 960

cgaggagaag gccttgaaga gagtccggag gaaaatcaag aacaagatct cagcccagga 1020

gagccgtcgt aagaagaagg agtatgtgga gtgtctagaa aagaaggtgg agacatttac 1080

atctgagaac aatgaactgt ggaagaaggt ggagaccctg gagaatgcca acaggaccct 1140

gctccagcag ctgcagaaac tccagactct ggtcaccaac aagatctcca gaccttacaa 1200

gatggccgcc acccagactg ggacctgcct catggtggca gccttgtgct ttgttctggt 1260

gctgggctcc ctcgtgccct gccttcccga gttctcctcc ggctcccaga ctgtgaagga 1320

agacccccctg gccgcagacg gcgtctacac ggccagccag atgccctccc gaagcctcct 1380

attctacgat gacggggcag gcttatggga agatggccgc agcaccctgc tgcccatgga 1440

gcccccagat ggctgggaaa tcaaccccgg ggggccggca gagcagcggc cccgggacca 1500

cctgcagcat gatcacctgg acagcaccca cgagaccacc aagtacctga gtgaggcctg 1560

gcctaaagac ggtggaaacg gcaccagccc cgacttctcc cactccaagg agtggttcca 1620

cgacagggat ctgggcccca acaccaccat caaactctcc taggccatgc caagacccag 1680

gacataggac ggacccctgg tacccagaag aggagttctt gctcactaac ccggatccgc 1740

ctcgtgcccc tgcctcctgg agcttcccat tccaggagaa aaggctccac ttcccagccc 1800

ttccttgccc ctgacatttg gactcttccc ttgggccgac cactctgttc tcattctcct 1860

tcccaccaac atccatccgt ccttctcaga caaaccactc actgggtacc ccacctcctc 1920

tctcatatgc ccaacacgac cactgcctcc ctgcccccac acctgcaccc aaacagacac 1980

atcaacgcac cccactcaca gacacccctt accccacccc cactgtacag agaccaagaa 2040

cagaaattgt ttgtaaataa tgaaccttat tttttattat tgccaatccc ctaagatatt 2100

gtattttaca aatctccctc ttcccttcgc ccctcccttg ttttatattt tatgaagtta 2160

gtgcgggctt tgctgctccc tggcccagga aagagggact acctgaccct cacctggcac 2220

ccccctgctg ctgcccaagc cgctgggcct ttttaattgc caaactgctc tcttcatcag 2280

ctcagcacat gctttaagaa agcaaaccca aaaaaaaaaa aaaaaagatg cagcatcaaa 2340

aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2370

<210> 58
<211> 1605
<212> DNA
<213> Homo sapiens

<400> 58
atggccacag gactccaggt tcccctgccg tggctggcca caggactgct gcttctcctc 60

agtgtccagc cctgggctga gagtggaaag gtgttggtgg tgcccattga tggcagccac 120

tggctcagca tgcgggaggt cttgcgggag ctccatgcca gaggccacca ggcagtggtc 180

ctcaccccag aggtgaatat gcacatcaaa gaagagaact ttttcaccct gacaacctat 240

gccatttcgt ggacccagga tgaatttgat cgccatgtgc tgggccacac tcaactgtac 300

tttgaaacag aacattttct gaagaaattt ttcagaagta tggcaatgtt gaacaatatg 360

tctttggtct atcataggtc ttgtgtggag ctactacata atgaggccct gatcaggcac 420

ctgaatgcta cttcctttga tgtggtttta acagaccccg ttaacctctg cgcggcagtg 480

ctggctaagt acctgtcgat tcctactgtg tttttttga ggaacattcc atgtgattta 540

gactttaagg gcacacagtg tccaaaccct tcctcctata ttcctagatt actaacaacc 600

aattcagacc acatgacatt catgcaaagg gtcaagaaca tgctctaccc tctggccctg 660

tcctacattt gccatgcttt ttctgctcct tatgcaagcc ttgcctctga gctttttcag 720

agagaggtgt cagtggtgga tattctcagt catgcatctg tgtggctgtt ccgaggggac 780

tttgtgatgg actaccccag gccaatcatg cccaacatgg tcttcattgg gggcatcaac 840

tgtgccaaca ggaagccact atctcaggaa tttgaagcct acattaatgc ttctggagaa 900

catggaattg tggttttctc tttgggatca atggtctcag aaattccaga gaagaaagct 960

atggcaattg ctgatgcttt gggcaaaatc cctcagacag tcctgtggcg gtacactgga 1020

acccgaccat cgaatcttgc gaacaacacg atacttgtta agtggctacc ccaaaacgat 1080

ctgcttggtc acccgatgac ccgtgccttt atcacccatg ctggttccca tggtgtttat 1140

gaaagcatat gcaatggcgt tcccatggtg atgatgccct tgtttggtga tcagatggac 1200

aatgcaaagc gcatggagac taagggagct ggagtgaccc tgaatgttct ggaaatgact 1260

tctgaagatt tagaaaatgc tctaaaagca gtcatcaatg acaaaagtta caaggagaac 1320

atcatgcgcc tctccagcct tcacaaggac cgcccggtgg agccgctgga cctggccgtg 1380

ttctgggtgg agtttgtgat gaggcacaag ggcgcgccac acctgcgccc cgcagcccac 1440

gacctcacct ggtaccagta ccattccttg gacgtgattg gtttcctctt ggccgtcgtg 1500

ctgacagtgg ccttcatcac ctttaaatgt tgtgcttatg gctaccggaa atgcttgggg 1560

aaaaaagggc gagttaagaa agcccacaaa tccaagaccc attga 1605

<210> 59
<211> 2879
<212> DNA
<213> Homo sapiens

<400> 59
ggcacccaat aaatacataa ttattagaat gaatacattc tatcacaatg tcttaattca 60

acagattctt ggcacctgtg gatttaacac tggtagtttc tactatgtac aaatggcttt 120

ctagggtcat ggcattcagg tatcaaagaa actgatgttt tcagctcatg ttcacatagt 180

tactcttaca aagtaatata atcctggttc tactacttac aatctgtgta accttgaaca 240

aattccttaa actcttgtgg agctgctgtg aaggttaaat gagttaattc acataaatac 300

ttaaaatcgc atctgataca cagtagataa tattcaataa atattagctc tgtgtgtgtg 360

tgtgtgcgtg tgtcatactt atgaaaagaa agccaacagg tggtaccaaa agtgaagata 420

aaataagata gtctaatcaa gtgatggttt tcacacacac aaaaaggatg ttttatggtg 480

gaaaatgtta ttctatagct gtgttcttga actttaaaag tagcaatgat cttgaaataa 540

atctctcaga aatgtgaaga ctgtacttct tgctgaaatc aatataacag cctaacaggt 600

gtctcctgtc ttgataaagt aggccattcc taaatctatc ccatgctgtg gatgttattc 660

ccactgctaa aacaacttta ctcacagtct gttcaatgct aatctcaaat ataatctcat 720

cagtaaattc ttttcctaat cattttccaa gatacctgat tactcctgtc tttgaaatat 780

ccaaatagtc tacagccgta ccatcctgaa tgtgccctat ctcgtctgaa acatccaaat 840

aacctcgaac ttcttattct actacatagt aaaatcattt gtgtacttat cctactagat 900

tatatgagac tgcttcttgt tcatcatgca ttcaagattt actgagtgct tgtcatatgc 960

gaggtacaga ggatacaaag gcaatgagga catgcaataa ataatgcagc aacaccatag 1020

cagtaggtac actatgcaga gatggcataa atgaggatga tctcttctac cacacatctg 1080

cagtatctag aatggcacaa catgtatggt agggacccat aagtatttgt caactttaat 1140

tcctacctgc tttttgaagt ttttccatac cactatagct tccctttttt tttggttctc 1200

ctcaaggaga atggtataga cagaatttgc tccctaaaag tctgtctaca ccattctgca 1260

catggtatct tttaatctat gtgttagcat cacaggctgt tatttaatat tttacatata 1320

aatatgtcct atcttcccca actataaaac atgtgttcaa aagagcaaga aatcctagag 1380

cactctgtac ttattactaa gcatttagta tctgttcaat ggtcctacaa tttccgaaag 1440

caaccaaaat atgtcatgca cctatttaca tagctgatag catcacttct gaaccacccc 1500

acctgtgctc tgggttctct atgaaacaag tagctttcac ataggtgttc ttaaagcagg 1560

aggccaaaga aatgtctgct ggaagcatga gactatgtca ttgttctcaa gctaggagtc 1620

cagaacttag aaattctgac agatttagct cttcttccat ctagatgcct gggtcctctg 1680

agaattcaga cacaaatttg tataatgaat tcacccagat attttgctaa gctaggtgcc 1740

tataagataa tatgcacaca gaaagcactc agtaaatgac agtttccttt ttctccaatc 1800

ttacaaggtc ctagatcctg ttggtaacta agaaaaggta aatgcaacta tcaaccactt 1860

aattccaatg ctttgactat ccaggagaaa ttaattcctg gttccctgtt gattctaatc 1920

taggagacag cttaagggag ctcatgggtc ttgaagctta taaggtgtac agtaagtctt 1980

cacttaatgc cactgatcat tcttggaaac tgtgatttca ggcaaaaata catacagcag 2040

gtccttgaat agtgttgttt cattcaactt cattccattg taatgttgat gagaacaaaa 2100

aattggtttt gttatatgta gttttgcttc aagtcgcagt ttcaaaaaac ttatgttaag 2160

tgaggactta attcacctga aagcttatca cacactcaaa tataacaaat aggaaacatt 2220

atgcaacttg aatacaagag tatgttcatt ggtttctata gttatcattc catgtacagt 2280

attcacgtga attattggat gaaaagtcca attatttaca tatttggata caatcatact 2340

atactagaac tgaagaccat acaggtctct gttccagcat tttctggcta cctcatggca 2400

ctgcataatc acttccaccc aaatctagcc aaatctaagt ttaagcactt ctgtatctat 2460

tccaagacaa actccctttc ttgtttaatc tcagtgactc ttacttctag agagggcact 2520

cttccttcta tatctcttcc acctctaacc tttctaacca tcaagaacat acaatagata 2580

gtagatctca cattaatatc aagtcttgac tccctacttc ccgtcattcc tcacaggaca 2640

gaagcagagt gggtggtggt tatgtttgac agaaggcatt aggttgacaa cttgtcatga 2700

ttttgacggt aagccaccat gattgtgttc tctgcctctg gttgaccttа caaaaaccat 2760

tggaactgtg actttgaaag gtgctcttgc taagcttata tgtgcctgtt aatgaaagtg 2820

cctgaaagac cttccttaat aaagaaggtt ctaagctgaa aaaaaaaaaa aaaaaaaaa 2879

<210> 60
<211> 353
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (218)..(218)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (353)..(353)
<223> n is a, c, g, or t
<400> 60
cttattaagg aaatactttg cataaattaa tcagccccag agtgctttaa ttctcttaaa 60

taccggtgtc tttgatcagg atgacatgtg ccatttttca gaggacgtgc agacaggctg 120

gcattctaga ttacttttct tactctgaaa catggcctgt ttgggagtgc gggattcaaa 180

ggtggtccca ccgctgcccc tactgcaaat ggcagttnta atcttatctt ttggcttctg 240

cagatggttg caattgatcc ttaaccaata atggtcagtc ctcatctctg tcctgcttca 300

taggtgccac cttgtgtgtt tgaaggggct ttgtaccttt agagtgtagg tgn 353

<210> 61
<211> 2423
<212> DNA
<213> Homo sapiens

<400> 61
gtacttcttc cgcctactgt atcatagcag cttagaatcc cagctgctgg ctcgggctgc 60

agttctctca tggctcgcgc agggtggacc agccccgttc ctttatgtgt gtgtctactg 120

ctgacctgtg gctttgccga ggcagggaag ctgctggtag tgcccatgga tgggagtcac 180

tggttcacca tgcagtcggt ggtggagaaa cttatcctca gggggcatga ggtggttgta 240

gtcatgccag aggtgagttg gcaactggaa agatcactga attgcacagt gaagacttac 300

tcaacctcgt acactctgga agatcagaac cgggaattca tggttttcgc ccatgctcaa 360

tggaaagcac aggcacaaag tatattttct ctattaatga gttcatccag tggttttctt 420

gacttatttt tttcgcattg caggagtttg tttaatgacc gaaaattagt agaatactta 480

aaggagagtt cttttgatgc agtgtttctg gatccttttg atacctgtgg cttaattgtt 540

gctaaatatt tctccctccc ctctgtggtc ttcaccaggg gaatattttg ccaccatctt 600

gaagaaggtg cacagtgccc tgctcctctt tcctatgtcc ccaatgatct cttagggttc 660

tcagatgcca tgactttcaa ggagagagta tggaaccaca tcgtgcactt ggaggaccat 720

ttattttgcc agtatctttt tagaaatgcc ctagaaatag cctctgaaat tctccaaacc 780

cctgtcacgg catatgatct ctacagtcac acatcaattt ggttgttgcg aacggacttt 840

gttttggact atcccaaacc cgtgatgccc aacatgatct tcattggtgg tatcaactgt 900

catcagggaa agccattgcc tatggaattt gaagcctaca ttaatgcttc tggagaacat 960

ggaattgtgg ttttctcttt gggatcaatg gtctcagaaa ttccagagaa gaaagctatg 1020

gcaattgctg atgctttggg caaaatccct cagacagtcc tgtggcggta cactggaacc 1080

cgaccatcga atcttgcgaa caacacgata cttgttaagt ggctacccca aaacgatctg 1140

cttggtcacc cgatgacccg tgcctttatc acccatgctg gttcccatgg tgtttatgaa 1200

agcatatgca atggcgttcc catggtgatg atgcccttgt ttggtgatca gatggacaat 1260

gcaaagcgca tggagactaa gggagctgga gtgaccctga atgttctgga aatgacttct 1320

gaagatttag aaaatgctct aaaagcagtc atcaatgaca aaagttacaa ggagaacatc 1380

atgcgcctct ccagccttca caaggaccgc ccggtggagc cgctggacct ggccgtgttc 1440

tgggtggagt ttgtgatgag gcacaagggc gcgccacacc tgcgccccgc agcccacgac 1500

ctcacctggt accagtacca ttccttggac gtgattggtt tcctcttggc cgtcgtgctg 1560

acagtggcct tcatcacctt taaatgttgt gcttatggct accggaaatg cttggggaaa 1620

aaagggcgag ttaagaaagc ccacaaatcc aagacccatt gagaagtggg tgggaaataa 1680

ggtaaaattt tgaaccattc cctagtcatt tccaaacttg aaaacagaat cagtgttaaa 1740

ttcattttat tcttattaag gaaatacttt gcataaatta atcagcccca gagtgcttta 1800

aaaaaattct cttaaataaa aataatagac tcgctagtca gtaaagatat ttgaatatgt 1860

atcgtgcccc ctccggtgtc tttgatcagg atgacatgtg ccatttttca gaggacgtgc 1920

agacaggctg gcattctaga ttacttttct tactctgaaa catggcctgt ttgggagtgc 1980

gggattcaaa ggtggtccca ccgctgcccc tactgcaaat ggcagtttta atcttatctt 2040

ttggcttctg cagatggttg caattgatcc ttaaccaata atggtcagtc ctcatctctg 2100

tcctgcttca taggtgccac cttgtgtgtt taaagaaggg aagctttgta cctttagagt 2160

gtaggtgaaa tgaatgaatg gcttggagtg cactgagaac agcatatgat ttcttgcttt 2220

ggggaaaaag aatgatgcta tgaaattggt gggtggtgta tttgagaaga taatcattgc 2280

ttatgtcaaa tggagctgaa tttgataaaa acccaaaata cagctatgaa gtgctgggca 2340

agtttacttt ttttctgatg tttcctacaa ctaaaaataa attaataaat ttatataaat 2400

tctatttaaa aaaaaaaaaa aaa 2423

<210> 62
<211> 2351
<212> DNA
<213> Homo sapiens

<400> 62
aggagcaaag gcgccatggc tgtggagtcc cagggcggac gcccacttgt cctgggcctg 60

ctgctgtgtg tgctgggccc agtggtgtcc catgctggga agatactgtt gatcccagtg 120

gatggcagcc actggctgag catgcttggg gccatccagc agctgcagca gaggggacat 180

gaaatagttg tcctagcacc tgacgcctcg ttgtacatca gagacggagc attttacacc 240

ttgaagacgt accctgtgcc attccaaagg gaggatgtga aagagtcttt tgttagtctc 300

gggcataatg tttttgagaa tgattctttc ctgcagcgtg tgatcaaaac atacaagaaa 360

ataaaaaagg actctgctat gcttttgtct ggctgttccc acttactgca caacaaggag 420

ctcatggcct ccctggcaga aagcagcttt gatgtcatgc tgacggaccc tttccttcct 480

tgcagcccca tcgtggccca gtacctgtct ctgcccactg tattcttctt gcatgcactg 540

ccatgcagcc tggaatttga ggctacccag tgccccaacc cattctccta cgtgcccagg 600

cctctctcct ctcattcaga tcacatgacc ttcctgcagc gggtgaagaa catgctcatt 660

gccttttcac agaacttttct gtgcgacgtg gtttattccc cgtatgcaac ccttgcctca 720

gaattccttc agagagaggt gactgtccag gacctattga gctctgcatc tgtctggctg 780

tttagaagtg actttgtgaa ggattaccct aggcccatca tgcccaatat ggtttttgtt 840

ggtggaatca actgccttca ccaaaatcca ctatcccagg aatttgaagc ctacattaat 900

gcttctggag aacatggaat tgtggttttc tctttgggat caatggtctc agaaattcca 960

gagaagaaag ctatggcaat tgctgatgct ttgggcaaaa tccctcagac agtcctgtgg 1020

cggtacactg gaacccgacc atcgaatctt gcgaacaaca cgatacttgt taagtggcta 1080

ccccaaaacg atctgcttgg tcacccgatg acccgtgcct ttatcaccca tgctggttcc 1140

catggtgttt atgaaagcat atgcaatggc gttcccatgg tgatgatgcc cttgtttggt 1200

gatcagatgg acaatgcaaa gcgcatggag actaagggag ctggagtgac cctgaatgtt 1260

ctggaaatga cttctgaaga tttagaaaat gctctaaaag cagtcatcaa tgacaaaagt 1320

tacaaggaga acatcatgcg cctctccagc cttcacaagg accgcccggt ggagccgctg 1380

gacctggccg tgttctgggt ggagtttgtg atgaggcaca agggcgcgcc acacctgcgc 1440

cccgcagccc acgacctcac ctggtaccag taccattcct tggacgtgat tggtttcctc 1500

ttggccgtcg tgctgacagt ggccttcatc acctttaaat gttgtgctta tggctaccgg 1560

aaatgcttgg ggaaaaaagg gcgagttaag aaagcccaca aatccaagac ccattgagaa 1620

gtgggtggga aataaggtaa aattttgaac cattccctag tcatttccaa acttgaaaac 1680

agaatcagtg ttaaattcat tttattctta ttaaggaaat actttgcata aattaatcag 1740

ccccagagtg ctttaaaaaa ttctcttaaa taaaaataat agactcgcta gtcagtaaag 1800

atatttgaat atgtatcgtg ccccctccgg tgtctttgat caggatgaca tgtgccattt 1860

ttcagaggac gtgcagacag gctggcattc tagattactt ttcttactct gaaacatggc 1920

ctgtttggga gtgcgggatt caaaggtggt cccaccgctg cccctactgc aaatggcagt 1980

tttaatctta tcttttggct tctgcagatg gttgcaattg atccttaacc aataatggtc 2040

agtcctcatc tctgtcctgc ttcataggtg ccaccttgtg tgtttaaaga agggaagctt 2100

tgtaccttta gagtgtaggt gaaatgaatg aatggcttgg agtgcactga gaacagcata 2160

tgatttcttg ctttggggaa aaagaatgat gctatgaaat tggtgggtgg tgtatttgag 2220

aagataatca ttgcttatgt caaatggagc tgaatttgat aaaaacccaa aatacagcta 2280

tgaagtgctg ggcaagttta ctttttttct gatgtttcct acaactaaaa ataaattaat 2340

aaatttataa a 2351

<210> 63
<211> 2478
<212> DNA
<213> Homo sapiens

<400> 63
ctggagatac cggggctgaa gcatatggag tcacccagcc cggtgtccat gtccttggat 60

aggccattgc ttttagagct ggagatgggt gcacaggctg atgtggctag ggatggccac 120

tttcctggga ctttgatggt agatgtccga aggtcaatct ctttttttatg aatattcttc 180

atataatcac ctaagcttga ataataggtg agcacgccat cggaacacag ggtgacgtat 240

ttctttttcc atgtcttcag ccattttcca cttcgcttta agagcatgcc ctgtttaatg 300

gggatggctc tgccgctccc gatggtgtca gcatgattct ccggggcttt cctctctttg 360

tctgggtcac tcccttttctc agatgtaaac aggttggacc agcgcatgga ccgcttgcaa 420

acgggggtgg gtgtgttggc agtgggagga acactgaact gagggtcctc ctggctggtg 480

ctgggagtcg gtggaatgga ggaggaatag ttatttaaac tcccacctcc atttcttttc 540

ttcataatgt gcacggtgga aaccgcaaat gagtgtaact gttcatcagg tatgctcaaa 600

gatctatctg catctctttg tgtgatatga tgaggtatct ccaaggtcac agatattatt 660

gtcattgtaa gataatgctg gatggctgtg ctgtcatcaa ggaatattgt cgaacacgag 720

ctgtattgtt gactgaaacg ctcagtagat acatggtttg tacagttgct tcttcttatt 780

tctacaacat ctgtttgaga gttcctctgg aatattgtgc ttgcctctgg attggcagaa 840

gagttaaact ccaaagcatc tgtttgagag ttcctctgga atattgtgct tgcctctgga 900

ttggcagaaa ggttaaactc caaagcttca ggcatctccc ggtcacgaac ctggtgcatg 960

tggaggtcct caccaacttc aacagtcacc tcagcaggct gtacagcagc agccatgggc 1020

gctcctgcca tcctgtcctc agcttcaggc accaccactg acctgggaca gtgaatcgac 1080

aatgccgtct tctgtctcgt ggggcatcct cctgctggca ggcctgtgct gcctggtccc 1140

tgtctccctg gctgaggatc cccagggaga tgctgcccag aagacagata catcccacca 1200

tgatcaggat cacccaacct tcaacaagat caccccaac ctggctgagt tcgccttcag 1260

cctataccgc cagctggcac accagtccaa cagcaccaat atcttcttct ccccagtgag 1320

catcgctaca gcctttgcaa tgctctccct ggggaccaag gctgacactc acgatgaaat 1380

cctggagggc ctgaatttca acctcacgga gattccggag gctcagatcc atgaaggctt 1440

ccaggaactc ctccgtaccc tcaaccagcc agacagccag ctccagctga ccaccggcaa 1500

tggcctgttc ctcagcgagg gcctgaagct agtggataag tttttggagg atgttaaaaa 1560

gttgtaccac tcagaagcct tcactgtcaa cttcggggac accgaagagg ccaagaaaca 1620

gatcaacgat tacgtggaga agggtactca agggaaaatt gtggatttgg tcaaggagct 1680

tgacagagac acagtttttg ctctggtgaa ttacatcttc tttaaaggca aatgggagag 1740

acccctttgaa gtcaaggaca ccgaggaaga ggacttccac gtggaccagg tgaccaccgt 1800

gaaggtgcct atgatgaagc gtttaggcat gtttaacatc cagcactgta agaagctgtc 1860

cagctgggtg ctgctgatga aatacctggg caatgccacc gccatcttct tcctgcctga 1920

tgaggggaaa ctacagcacc tggaaaatga actcacccac gatatcatca ccaagttcct 1980

ggaaaatgaa gacagaaggt ctgccagctt acatttaccc aaactgtcca ttactggaac 2040

ctatgatctg aagagcgtcc tgggtcaact gggcatcact aaggtcttca gcaatggggc 2100

tgacctctcc ggggtcacag aggaggcacc cctgaagctc tccaaggccg tgcataaggc 2160

tgtgctgacc atcgacgaga aagggactga agctgctggg gccatgtttt tagaggccat 2220

acccatgtct atccccccg aggtcaagtt caacaaaccc tttgtcttct taatgattga 2280

acaaaatacc aagtctcccc tcttcatggg aaaagtggtg aatcccaccc aaaaataact 2340

gcctctcgct cctcaacccc tcccctccat ccctggcccc ctccctggat gacattaaag 2400

aagggttgag ctggaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2460

aaaaaaaaaa aaaaaaaa 2478

<210> 64
<211> 891
<212> DNA
<213> Homo sapiens

<400> 64
accccatccc ccactcctat accggtcctc cattttggtg cctgcaaagc tctgggaaag 60

aatcccggga aacgaaaaat ggtgggtttg ggggaaggga ggtaagggga gaaagctgga 120

gggaggggct ttaattggag gccccgtaga ggacgcgcgg aacttctaag gtgggaaaaa 180

acgaaattaa aaaatccttt gatatcaggg ctctgaatcc tgctggtcag agcaccaagc 240

attcagtctc tctccttgcc tttgtcttac ttgtgttcaa agaaaaacaa ccagaaaaaa 300

aaaatctcat catggcaaat attcaccagg aaaacgaaga gatggagcag cctatgcaga 360

atggagagga agaccgccct ttgggaggag gtgaaggcca ccagcctgca ggaaatcgac 420

ggggacaggc tcgccgactt gcccctaatt ttcgatgggc catacccaat aggcagatca 480

atgatgggat gggtggagat ggagatgata tggaaatatt catggaggag atgagagaaa 540

tcagaagaaa acttagggag ctgcagttga ggaattgtct gcgtatcctt atgggggagc 600

tctctaatca ccatgaccat catgatgaat tttgccttat gccttgactc ctgccattta 660

tcatgagatt aatactgtga ttcccgctgt tttctttttc cttgcatttt cctaatatgc 720

ctttactgat ccgtttgctg tgaaccctat gttatttcca tgtgtcaagt gggtcttgtg 780

ttgccagctt ctatttgaag attgcctttg cactcagtgt aagtttctgt cagcagtagt 840

ttcacccatt tgcatggaaa aatttaaagc taataaagca atttaaaaag c 891

<210> 65
<211> 5910
<212> DNA
<213> Homo sapiens

<400> 65
agctccagcc gcactgcccc gatggctccc tacccctgtg gctgccacat cctgctgctg 60

ctcttctgct gcctggcggc tgcccgggcc aacctgctga acctgaactg gctttggttc 120

aataatgagg acaccagcca cgcagctacc acgatccctg agccccaggg gcccctgcct 180

gtgcagccca cagcagatac caccacacac gtgacccccc ggaatggttc cacagagcca 240

gcgacagccc ctggcagccc tgagccaccc tcagagctgc tggaagatgg ccaggacacc 300

cccacttctg ccgagagccc ggacgcgcca gaggagaaca ttgccggtgt cggagccgag 360

atcctgaacg tggccaaagg catccggagc ttcgtccagc tgtggaatga cactgtcccc 420

actgagagct tggccagggc ggaaaccctg gtcctggaga ctcctgtggg ccccccttgcc 480

ctcgctgggc cttccagcac cccccaggag aatgggacca ctctctggcc cagccgtggc 540

attcctagct ctccgggcgc ccacacaacc gaggctggca ccttgcctgc acccacccca 600

tcgcctccgt ccctgggcag gccctgggca ccactcacgg ggccctcagt gccaccacca 660

tcttcagagc gcatcagcga ggaggtgggg ctgctgcagc tccttgggga ccccccgccc 720

cagcaggtca cccagacgga tgaccccgac gtcgggctgg cctacgtctt tgggccagat 780

gccaacagtg gccaagtggc ccggtaccac ttccccagcc tcttcttccg tgacttctca 840

ctgctgttcc acatccggcc agccacagag ggcccagggg tgctgttcgc catcacggac 900

tcggcgcagg ccatggtctt gctgggcgtg aagctctctg gggtgcagga cgggcaccag 960

gacatctccc tgctctacac agaacctggt gcaggccaga cccacacagc cgccagcttc 1020

cggctccccg ccttcgtcgg ccagtggaca cacttagccc tcagtgtggc aggtggcttt 1080

gtggccctct acgtggactg tgaggagttc cagagaatgc cgcttgctcg gtcctcacgg 1140

ggcctggagc tggagcctgg cgccgggctc ttcgtggctc aggcgggggg agcggaccct 1200

gacaagttcc agggggtgat cgctgagctg aaggtgcgca gggaccccca ggtgagcccc 1260

atgcactgcc tggacgagga aggcgatgac tcagatgggg cattcggaga ctctggcagc 1320

gggctcgggg acgcccggga gcttctcagg gaggagacgg gcgcggccct aaaacccagg 1380

ctccccgcgc cacccccccgt caccacgcca cccttggctg gaggcagcag cacggaagat 1440

tccagaagtg aagaagtcga ggagcagacc acggtggctt cgttaggagc tcagacactt 1500

cctggctcag attctgtctc cacgtgggac gggagtgtcc ggacccctgg gggccgcgtg 1560

aaagagggcg gcctgaaggg gcagaaaggg gagccaggtg ttccgggccc acctggccgg 1620

gcaggccccc caggatcccc atgcctacct ggtcccccgg gtctcccgtg cccagtgagt 1680

cccctgggtc ctgcaggccc agcgttgcaa actgtccccg gaccacaagg acccccaggg 1740

cctccgggga gggacggcac ccctggaagg gacggcgagc cgggcgaccc cggtgaagac 1800

ggaaagccgg gcgacaccgg gccacaaggc ttccctggga ctccagggga tgtaggtccc 1860

aagggagaca agggagaccc tggggttgga gagagagggc ccccaggacc ccaagggcct 1920

ccagggcccc caggaccctc cttcagacac gacaagctga ccttcattga catggaggga 1980

tctggctttg ggggcgatct ggaggccctg cggggtcctc gaggcttccc tggacctccc 2040

ggaccccccg gtgtcccagg cctgcccggc gagccaggcc gctttggggt gaacagctcc 2100

gacgtcccag gacccgccgg ccttcctggt gtgcctgggc gcgagggtcc ccccgggttt 2160

cctggcctcc cgggaccccc aggccctccg ggaagagagg ggcccccagg aaggactggg 2220

cagaaaggca gcctgggtga agcaggcgcc ccaggacata aggggagcaa gggagccccc 2280

ggtcctgctg gtgctcgtgg ggagagcggc ctggcaggag cccccggacc tgctggacca 2340

ccaggccccc ctgggccccc tgggccccca ggaccaggac tccccgctgg atttgatgac 2400

atggaaggct ccgggggggcc cttctggtca acagcccgaa gcgctgatgg gccacaggga 2460

cctcccggcc tgccgggact taaggggggat cctggcgtgc ctgggctgcc gggggcgaag 2520

ggagaagttg gagcagatgg aatccccggg ttccccggcc tccctggcag agagggcatt 2580

gctgggcccc aggggccaaa gggagacaga ggcagccggg gagaaaaggg agatccaggg 2640

aaggacggag tcgggcagcc gggcctccct ggcccccccg gacccccggg acctgtggtc 2700

tacgtgtcgg agcaggacgg atccgtcctg agcgtgccgg gacctgaggg ccggccgggt 2760

ttcgcaggct ttcccggacc tgcaggaccc aagggcaacc tgggctctaa gggcgaacga 2820

ggctccccgg gacccaaggg tgagaagggt gaaccgggca gcatcttcag ccccgacggc 2880

ggtgccctgg gccctgccca gaaaggagcc aagggagagc cgggcttccg aggacccccg 2940

ggtccatacg gacggccggg gtacaaggga gagattggct ttcctggacg gccgggtcgc 3000

cccgggatga acggattgaa aggagagaaa ggggagccgg gagatgccag ccttggattt 3060

ggcatgaggg gaatgcccgg ccccccagga cctccagggc ccccaggccc tccagggact 3120

cctgtttacg acagcaatgt gtttgctgag tccagccgcc ccgggcctcc aggattgcca 3180

gggaatcagg gccctccagg acccaagggc gccaaaggag aagtgggccc ccccggacca 3240

ccagggcagt ttccgtttga ctttcttcag ttggaggctg aaatgaaggg ggagaaggga 3300

gaccgaggtg atgcaggaca gaaaggcgaa agggggggagc ccgggggcgg cggtttcttc 3360

ggctccagcc tgcccggccc ccccggcccc ccaggcccac gtggctaccc tgggattcca 3420

ggtcccaagg gagagagcat ccggggccag cccggcccac ctggacctca gggacccccc 3480

ggcatcggct acgaggggcg ccagggccct cccggccccc caggcccccc agggcccccc 3540

tcatttcctg gccctcacag gcagactatc agcgttcccg gccctccggg cccccctggg 3600
cccccctgggc cccctggaac catgggcgcc tcctcagggg tgaggctctg ggctacacgc 3660

caggccatgc tgggccaggt gcacgaggtt cccgagggct ggctcatctt cgtggccgag 3720

caggaggagc tctacgtccg cgtgcagaac gggttccgga aggtccagct ggaggcccgg 3780

acaccactcc cacgagggac ggacaatgaa gtggccgcct tgcagccccc cgtggtgcag 3840

ctgcacgaca gcaaccccta cccgcggcgg gagcaccccc accccaccgc gcggccctgg 3900

cgggcagatg acatcctggc cagccccccc cgcctgcccg agccccagcc ctaccccgga 3960

gccccgcacc acagctccta cgtgcacctg cggccggcgc gacccacaag cccacccgcc 4020

cacagccacc gcgacttcca gccggtgctc cacctggttg cgctcaacag ccccctgtca 4080

ggcggcatgc ggggcatccg cggggccgac ttccagtgct tccagcaggc gcgggccgtg 4140

gggctggcgg gcaccttccg cgccttcctg tcctcgcgcc tgcaggacct gtacagcatc 4200

gtgcgccgtg ccgaccgcgc agccgtgccc atcgtcaacc tcaaggacga gctgctgttt 4260

cccagctggg aggctctgtt ctcaggctct gagggtccgc tgaagcccgg ggcacgcatc 4320

ttctcctttg acggcaagga cgtcctgagg caccccacct ggccccagaa gagcgtgtgg 4380

catggctcgg accccaacgg gcgcaggctg accgagagct actgtgagac gtggcggacg 4440

gaggctccct cggccacggg ccaggcctcc tcgctgctgg ggggcaggct cctggggcag 4500

agtgccgcga gctgccatca cgcctacatc gtgctctgca ttgagaacag cttcatgact 4560

gcctccaagt agccaccgcc tggatgcgga tggccggaga ggaccggcgg ctcggaggaa 4620

gcccccaccg tgggcaggga gcggccggcc agcccctggc cccaggacct ggctgccata 4680

ctttcctgta tagttcacgt ttcatgtaat cctcaagaaa taaaaggaag ccaaagagtg 4740

tatttttta aaagtttaaa acagaagcct gatgctgaca ttcacctgcc ccaactctcc 4800

cctgacctgt gagcccagct gggtcaggca gggtgcagta tcatgccctg tgcaacctct 4860

tggcctgatc agaccacggc tcgatttctc caggatttcc tgctttggga agccgtgctc 4920

gccccagcag gtgctgactt catctcccac ctagcagcac cgttctgtgc acaaaaccca 4980

gacctgttag cagacaggcc ccgtgaggca atgggagctg aggccacact cagcacaagg 5040

ccatctgggc tcctccaggg tgtgtgctcg ccctgcggta gatgggaggg aggctcaggt 5100

ccctggggct agggggagcc ccttctgctc agctctgggc cattctccac agcaacccca 5160

ggctgaagca ggttcccaag ctcagaggcg cactgtgacc cccagctccg gcctgtcctc 5220

caacaccaag cacagcagcc tggggctggc ctcccaaatg agccatgaga tgatacatcc 5280

aaagcagaca gctccaccct ggccgagtcc aagctgggag attcaaggga cccatgagtt 5340

ggggtctggc agcctcccat ccagggcccc catctcatgc ccctggctgg gacgtggctc 5400

agccagcact tgtccagctg agcgccagga tggaacacgg ccacatcaaa gaggctgagg 5460

ctggcacagg acatgcggta gccagcacac agggcagtga gggagggctg tcatctgtgc 5520

actgcccatg gacaggctgg ctccagatgc agggcagtca ttggctgtct cctaggaaac 5580

ccatatcctt accctccttg ggactgaagg ggaaccccgg ggtgcccaca ggccgccctg 5640

cgggtgaaca aagcagccac gaggtgcaac aagggtcctct gtcagtcaca gccacccctg 5700

agatccggca acatcaaccc gagtcattcg ttctgtggag ggacaagtgg actcagggca 5760

gcgccaggct gaccacagca cagccaacac gcacctgcct caggactgcg acgaaaccgg 5820

tggggctggt tctgtaattg tgtgtgatgt gaagccaatt cagacaggca aataaaagtg 5880

acctttttaca ctgaaaaaaa aaaaaaaaaa 5910

<210> 66
<211> 2480
<212> DNA
<213> Homo sapiens

<400> 66
atggccgggc cgcgcgcgtg cgcgccgctc ctgctcctgc tcctcctcgg gcagcttctg 60

gcggccgccg gggcgcagag agtgggactc cccggccccc ccggcccccc agggcgccct 120

gggaagcccg gccaggacgg cattgacgga gaagctggtc ctccaggtct gcctggtccc 180

ccgggaccaa agggggcccc aggaaagccg gggaaaccag gagaggctgg gctgccggga 240

ctgccgggtg tggatggtct gactggacga gatggacccc ctggacccaa gggtgcccct 300

ggggaacggg gaagtctggg acccccgggg ccgcccgggc tgggggggcaa aggcctccct 360

ggacccccccg gagaggcagg agtgagcggc ccccaggtg ggatcggcct ccgcggcccc 420

ccgggacctc ctggactccc cggcctccct ggtccccccag gacctcccgg acccccctgga 480

cacccaggag tcctccctga aggcgctact gaccttcagt gcccaagtat ctgcccgcca 540

ggtcccccag ggcccccctgg aatgccaggg ttcaagggac ccactggcta caaaggcgag 600

caggggggaag tcggcaagga cggcgagaag ggtgaccctg gcccccctgg gcccgccggc 660

ctcccgggca gcgtggggct gcagggcccc cggggattac gaggactgcc agggccactc 720

gggcccccctg gggaccgggg tcccattggg ttccgagggc cgcctgggat cccaggagcg 780

cctgggaaag cgggtgaccg aggcgagagg ggcccagaag ggttccgcgg ccccaagggt 840

gacctcggca gacctggtcc caagggaacc cccggagtgg ccgggccaag cggagagccg 900

ggcatgccag gcaaggacgg ccagaatggc gtgccaggac tcgatggcca gaagggagag 960

gctggtcgca acggtgctcc gggagagaag ggcccaacg ggctgccggg cctccctgga 1020

cgagcggggt ccaaaggcga gaagggagaa cggggcagag ctggggagct gggtgaggcc 1080

ggcccctctg gagagccagg cgtccctgga gatgctggca tgcctgggga gcgcggtgag 1140

gctggccacc ggggctcagc gggggccctc ggcccacaag gccctcccgg agcccctggt 1200

gtccgaggct tccagggcca gaagggcagc atgggagacc ccggccttcc aggcccccag 1260

ggcctccgag gtgacgtggg cgaccggggt ccgggaggtg ccgaaggccc taagggagac 1320

cagggtattg caggttccga cggtcttcct ggggataaag gagaactggg tcccagcggc 1380

ctggtcggac ccaaaggaga gtctggcagt cgaggggagc tgggccccaa aggcacccag 1440

ggtcccaacg gcaccagcgg tgttcagggt gtccccgggc cccccggtcc tctgggcctg 1500

cagggcgtcc cgggtgttcc tggcatcacg gggaagccgg gagttccggg gaaggaggcc 1560

agcgagcagc gcatcaggga gctgtgtggg gggatgatca gcgaacaaat tgcacagtta 1620

gccgcgcacc taaggaagcc tttggcaccc gggtccattg gtcggcccgg tccagctggc 1680

ccccctgggc ccccaggacc cccaggctcc attggtcacc ctggcgctcg aggacccccc 1740

ggataccgcg gtcccactgg ggagctggga gaccccgggc ccagaggaaa ccagggtgac 1800

agaggagaca aaggcgcggc aggagcaggg ctggacgggc ctgaaggaga ccaggggccc 1860

caaggacccc aaggcgtgcc cggcaccagc aaggacggcc aggacggtgc tcccggcgag 1920

cctgggcctc ccggagatcc tgggcttcca ggtgccattg gggcccaggg gacaccgggg 1980

atctgcgaca cctcagcctg ccaaggagcc gtgttaggag gggtcgggga gaaatcaggc 2040

tctcgaagct cataaaattc aacgtgagga agcaagtgac aaggacgccc gaagcacagt 2100

ggacggtcat gaaggagcgg gggtgtggca ggcgggtgac gtccaggaga gggagcgccc 2160

ctggctgccc ctcggccgcc gactggacgc gtgggccttg ccagcgagca ccctcattgg 2220

gctgtcgcct gacagcatac ctcaaaaggc cctagctaat aaacctgtaa gcccagcatt 2280

tgagagaagg tagggtgtgt atatataaaa ggttgtgtac aactccacga ggtgaaaaat 2340

attcagtaac ttgtttgcat agcatttgtg taaagactat gatctcatcc caataaaatg 2400

atatattaaa tcttcagatt aatgactggc tacagagtaa caaaaaataa acaatttaat 2460

gtacagtaaa ttctctccca 2480

<210> 67
<211> 832
<212> PRT
<213> Homo sapiens

<400> 67

Met Ile Leu Gln Ala His Leu His Ser Leu Cys Leu Leu Met Leu Tyr
1 5 10 15

```
Leu Ala Thr Gly Tyr Gly Gln Glu Gly Lys Phe Ser Gly Pro Leu Lys
            20                  25                  30

Pro Met Thr Phe Ser Ile Tyr Glu Gly Gln Glu Pro Ser Gln Ile Ile
        35                  40                  45

Phe Gln Phe Lys Ala Asn Pro Pro Ala Val Thr Phe Glu Leu Thr Gly
    50                  55                  60

Glu Thr Asp Asn Ile Phe Val Ile Glu Arg Glu Gly Leu Leu Tyr Tyr
65                  70                  75                  80

Asn Arg Ala Leu Asp Arg Glu Thr Arg Ser Thr His Asn Leu Gln Val
                85                  90                  95

Ala Ala Leu Asp Ala Asn Gly Ile Ile Val Glu Gly Pro Val Pro Ile
            100                 105                 110

Thr Ile Glu Val Lys Asp Ile Asn Asp Asn Arg Pro Thr Phe Leu Gln
        115                 120                 125

Ser Lys Tyr Glu Gly Ser Val Arg Gln Asn Ser Arg Pro Gly Lys Pro
    130                 135                 140

Phe Leu Tyr Val Asn Ala Thr Asp Leu Asp Asp Pro Ala Thr Pro Asn
145                 150                 155                 160

Gly Gln Leu Tyr Tyr Gln Ile Val Ile Gln Leu Pro Met Ile Asn Asn
                165                 170                 175

Val Met Tyr Phe Gln Ile Asn Asn Lys Thr Gly Ala Ile Ser Leu Thr
            180                 185                 190

Arg Glu Gly Ser Gln Glu Leu Asn Pro Ala Lys Asn Pro Ser Tyr Asn
        195                 200                 205

Leu Val Ile Ser Val Lys Asp Met Gly Gly Gln Ser Glu Asn Ser Phe
    210                 215                 220

Ser Asp Thr Thr Ser Val Asp Ile Ile Val Thr Glu Asn Ile Trp Lys
225                 230                 235                 240

Ala Pro Lys Pro Val Glu Met Val Glu Asn Ser Thr Asp Pro His Pro
                245                 250                 255
```

```
Ile Lys Ile Thr Gln Val Arg Trp Asn Asp Pro Gly Ala Gln Tyr Ser
            260                 265                 270

Leu Val Asp Lys Glu Lys Leu Pro Arg Phe Pro Phe Ser Ile Asp Gln
        275                 280                 285

Glu Gly Asp Ile Tyr Val Thr Gln Pro Leu Asp Arg Glu Glu Lys Asp
    290                 295                 300

Ala Tyr Val Phe Tyr Ala Val Ala Lys Asp Glu Tyr Gly Lys Pro Leu
305                 310                 315                 320

Ser Tyr Pro Leu Glu Ile His Val Lys Val Lys Asp Ile Asn Asp Asn
                325                 330                 335

Pro Pro Thr Cys Pro Ser Pro Val Thr Val Phe Glu Val Gln Glu Asn
            340                 345                 350

Glu Arg Leu Gly Asn Ser Ile Gly Thr Leu Thr Ala His Asp Arg Asp
        355                 360                 365

Glu Glu Asn Thr Ala Asn Ser Phe Leu Asn Tyr Arg Ile Val Glu Gln
    370                 375                 380

Thr Pro Lys Leu Pro Met Asp Gly Leu Phe Leu Ile Gln Thr Tyr Ala
385                 390                 395                 400

Gly Met Leu Gln Leu Ala Lys Gln Ser Leu Lys Lys Gln Asp Thr Pro
                405                 410                 415

Gln Tyr Asn Leu Thr Ile Glu Val Ser Asp Lys Asp Phe Lys Thr Leu
            420                 425                 430

Cys Phe Val Gln Ile Asn Val Ile Asp Ile Asn Asp Gln Ile Pro Ile
        435                 440                 445

Phe Glu Lys Ser Asp Tyr Gly Asn Leu Thr Leu Ala Glu Asp Thr Asn
    450                 455                 460

Ile Gly Ser Thr Ile Leu Thr Ile Gln Ala Thr Asp Ala Asp Glu Pro
465                 470                 475                 480

Phe Thr Gly Ser Ser Lys Ile Leu Tyr His Ile Ile Lys Gly Asp Ser
                485                 490                 495
```

```
Glu Gly Arg Leu Gly Val Asp Thr Asp Pro His Thr Asn Thr Gly Tyr
            500                 505                 510

Val Ile Ile Lys Lys Pro Leu Asp Phe Glu Thr Ala Ala Val Ser Asn
        515                 520                 525

Ile Val Phe Lys Ala Glu Asn Pro Glu Pro Leu Val Phe Gly Val Lys
    530                 535                 540

Tyr Asn Ala Ser Ser Phe Ala Lys Phe Thr Leu Ile Val Thr Asp Val
545                 550                 555                 560

Asn Glu Ala Pro Gln Phe Ser Gln His Val Phe Gln Ala Lys Val Ser
                565                 570                 575

Glu Asp Val Ala Ile Gly Thr Lys Val Gly Asn Val Thr Ala Lys Asp
            580                 585                 590

Pro Glu Gly Leu Asp Ile Ser Tyr Ser Leu Arg Gly Asp Thr Arg Gly
        595                 600                 605

Trp Leu Lys Ile Asp His Val Thr Gly Glu Ile Phe Ser Val Ala Pro
    610                 615                 620

Leu Asp Arg Glu Ala Gly Ser Pro Tyr Arg Val Gln Val Val Ala Thr
625                 630                 635                 640

Glu Val Gly Gly Ser Ser Leu Ser Ser Val Ser Glu Phe His Leu Ile
                645                 650                 655

Leu Met Asp Val Asn Asp Asn Pro Pro Arg Leu Ala Lys Asp Tyr Thr
            660                 665                 670

Gly Leu Phe Phe Cys His Pro Leu Ser Ala Pro Gly Ser Leu Ile Phe
        675                 680                 685

Glu Ala Thr Asp Asp Asp Gln His Leu Phe Arg Gly Pro His Phe Thr
    690                 695                 700

Phe Ser Leu Gly Ser Gly Ser Leu Gln Asn Asp Trp Glu Val Ser Lys
705                 710                 715                 720

Ile Asn Gly Thr His Ala Arg Leu Ser Thr Arg His Thr Glu Phe Glu
                725                 730                 735

Glu Arg Glu Tyr Val Val Leu Ile Arg Ile Asn Asp Gly Gly Arg Pro
```

740 745 750

Pro Leu Glu Gly Ile Val Ser Leu Pro Val Thr Phe Cys Ser Cys Val
755 760 765

Glu Gly Ser Cys Phe Arg Pro Ala Gly His Gln Thr Gly Ile Pro Thr
770 775 780

Val Gly Met Ala Val Gly Ile Leu Leu Thr Thr Leu Leu Val Ile Gly
785 790 795 800

Ile Ile Leu Ala Val Val Phe Ile Arg Ile Lys Lys Asp Lys Gly Lys
805 810 815

Asp Asn Val Glu Ser Ala Gln Ala Ser Glu Val Lys Pro Leu Arg Ser
820 825 830

<210> 68
<211> 344
<212> PRT
<213> Homo sapiens

<400> 68

Met Gly Pro Pro Ser Ala Pro Pro Cys Arg Leu His Val Pro Trp Lys
1 5 10 15

Glu Val Leu Leu Thr Ala Ser Leu Leu Thr Phe Trp Asn Pro Pro Thr
20 25 30

Thr Ala Lys Leu Thr Ile Glu Ser Thr Pro Phe Asn Val Ala Glu Gly
35 40 45

Lys Glu Val Leu Leu Leu Ala His Asn Leu Pro Gln Asn Arg Ile Gly
50 55 60

Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly Asn Ser Leu Ile Val
65 70 75 80

Gly Tyr Val Ile Gly Thr Gln Gln Ala Thr Pro Gly Pro Ala Tyr Ser
85 90 95

Gly Arg Glu Thr Ile Tyr Pro Asn Ala Ser Leu Leu Ile Gln Asn Val
100 105 110

Thr Gln Asn Asp Thr Gly Phe Tyr Thr Leu Gln Val Ile Lys Ser Asp
115 120 125

```
Leu Val Asn Glu Glu Ala Thr Gly Gln Phe His Val Tyr Pro Glu Leu
    130                 135                 140

Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Asn Pro Val Glu Asp Lys
145                 150                 155                 160

Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Val Gln Asn Thr Thr Tyr
                165                 170                 175

Leu Trp Trp Val Asn Gly Gln Ser Leu Pro Val Ser Pro Arg Leu Gln
            180                 185                 190

Leu Ser Asn Gly Asn Met Thr Leu Thr Leu Leu Ser Val Lys Arg Asn
        195                 200                 205

Asp Ala Gly Ser Tyr Glu Cys Glu Ile Gln Asn Pro Ala Ser Ala Asn
    210                 215                 220

Arg Ser Asp Pro Val Thr Leu Asn Val Leu Tyr Gly Pro Asp Val Pro
225                 230                 235                 240

Thr Ile Ser Pro Ser Lys Ala Asn Tyr Arg Pro Gly Glu Asn Leu Asn
                245                 250                 255

Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser Trp Phe
            260                 265                 270

Ile Asn Gly Thr Phe Gln Gln Ser Thr Gln Glu Leu Phe Ile Pro Asn
        275                 280                 285

Ile Thr Val Asn Asn Ser Gly Ser Tyr Met Cys Gln Ala His Asn Ser
    290                 295                 300

Ala Thr Gly Leu Asn Arg Thr Thr Val Thr Met Ile Thr Val Ser Gly
305                 310                 315                 320

Ser Ala Pro Val Leu Ser Ala Val Ala Thr Val Gly Ile Thr Ile Gly
                325                 330                 335

Val Leu Ala Arg Val Ala Leu Ile
            340
```

<210> 69
<211> 100
<212> PRT
<213> Homo sapiens

<400> 69

Met Asp Ser Phe Ser Gln Asp Val Lys Thr Arg Leu Leu Ile Met Ile
1 5 10 15

Arg Leu Leu Pro Pro Phe Asn Leu Ser Leu Leu Met Pro Ala Ser Phe
20 25 30

Ala Trp Gln Asp Asp Ala Val Ile Ser Ile Ser Gln Glu Val Ala Ser
35 40 45

Glu Gly Asn Leu Thr Glu Cys Gln Ile Tyr Leu Val Asn Pro Asn Val
50 55 60

Leu His Lys Ile Arg Asp Pro Leu Val His Pro Val Thr Asp Ile Ser
65 70 75 80

Ser Ile Phe Asn Thr Ala Val Cys Ser Asn Val Gln Trp Ser Phe Ser
85 90 95

Glu Leu Asp Phe
100

<210> 70
<211> 135
<212> PRT
<213> Homo sapiens

<400> 70

Met Ala Cys Gly Leu Val Ala Ser Asn Leu Asn Leu Lys Pro Gly Glu
1 5 10 15

Cys Leu Arg Val Arg Gly Glu Val Ala Pro Asp Ala Lys Ser Phe Val
20 25 30

Leu Asn Leu Gly Lys Asp Ser Asn Asn Leu Cys Leu His Phe Asn Pro
35 40 45

Arg Phe Asn Ala His Gly Asp Ala Asn Thr Ile Val Cys Asn Ser Lys
50 55 60

Asp Gly Gly Ala Trp Gly Thr Glu Gln Arg Glu Ala Val Phe Pro Phe
65 70 75 80

Gln Pro Gly Ser Val Ala Glu Val Cys Ile Thr Phe Asp Gln Ala Asn
85 90 95

Leu Thr Val Lys Leu Pro Asp Gly Tyr Glu Phe Lys Phe Pro Asn Arg
100 105 110

Leu Asn Leu Glu Ala Ile Asn Tyr Met Ala Ala Asp Gly Asp Phe Lys
115 120 125

Ile Lys Cys Val Ala Phe Asp
130 135

<210> 71
<211> 492
<212> PRT
<213> Homo sapiens

<400> 71

Met Ala Leu Asn Ser Gly Ser Pro Pro Ala Ile Gly Pro Tyr Tyr Glu
1 5 10 15

Asn His Gly Tyr Gln Pro Glu Asn Pro Tyr Pro Ala Gln Pro Thr Val
20 25 30

Val Pro Thr Val Tyr Glu Val His Pro Ala Gln Tyr Tyr Pro Ser Pro
35 40 45

Val Pro Gln Tyr Ala Pro Arg Val Leu Thr Gln Ala Ser Asn Pro Val
50 55 60

Val Cys Thr Gln Pro Lys Ser Pro Ser Gly Thr Val Cys Thr Ser Lys
65 70 75 80

Thr Lys Lys Ala Leu Cys Ile Thr Leu Thr Leu Gly Thr Phe Leu Val
85 90 95

Gly Ala Ala Leu Ala Ala Gly Leu Leu Trp Lys Phe Met Gly Ser Lys
100 105 110

Cys Ser Asn Ser Gly Ile Glu Cys Asp Ser Ser Gly Thr Cys Ile Asn
115 120 125

Pro Ser Asn Trp Cys Asp Gly Val Ser His Cys Pro Gly Gly Glu Asp
130 135 140

Glu Asn Arg Cys Val Arg Leu Tyr Gly Pro Asn Phe Ile Leu Gln Val
145 150 155 160

Tyr Ser Ser Gln Arg Lys Ser Trp His Pro Val Cys Gln Asp Asp Trp

165 170 175

Asn Glu Asn Tyr Gly Arg Ala Ala Cys Arg Asp Met Gly Tyr Lys Asn
180 185 190

Asn Phe Tyr Ser Ser Gln Gly Ile Val Asp Asp Ser Gly Ser Thr Ser
195 200 205

Phe Met Lys Leu Asn Thr Ser Ala Gly Asn Val Asp Ile Tyr Lys Lys
210 215 220

Leu Tyr His Ser Asp Ala Cys Ser Ser Lys Ala Val Val Ser Leu Arg
225 230 235 240

Cys Ile Ala Cys Gly Val Asn Leu Asn Ser Ser Arg Gln Ser Arg Ile
245 250 255

Val Gly Gly Glu Ser Ala Leu Pro Gly Ala Trp Pro Trp Gln Val Ser
260 265 270

Leu His Val Gln Asn Val His Val Cys Gly Gly Ser Ile Ile Thr Pro
275 280 285

Glu Trp Ile Val Thr Ala Ala His Cys Val Glu Lys Pro Leu Asn Asn
290 295 300

Pro Trp His Trp Thr Ala Phe Ala Gly Ile Leu Arg Gln Ser Phe Met
305 310 315 320

Phe Tyr Gly Ala Gly Tyr Gln Val Glu Lys Val Ile Ser His Pro Asn
325 330 335

Tyr Asp Ser Lys Thr Lys Asn Asn Asp Ile Ala Leu Met Lys Leu Gln
340 345 350

Lys Pro Leu Thr Phe Asn Asp Leu Val Lys Pro Val Cys Leu Pro Asn
355 360 365

Pro Gly Met Met Leu Gln Pro Glu Gln Leu Cys Trp Ile Ser Gly Trp
370 375 380

Gly Ala Thr Glu Glu Lys Gly Lys Thr Ser Glu Val Leu Asn Ala Ala
385 390 395 400

Lys Val Leu Leu Ile Glu Thr Gln Arg Cys Asn Ser Arg Tyr Val Tyr
405 410 415

```
Asp Asn Leu Ile Thr Pro Ala Met Ile Cys Ala Gly Phe Leu Gln Gly
            420                 425                 430

Asn Val Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Val Thr Ser
        435                 440                 445

Lys Asn Asn Ile Trp Trp Leu Ile Gly Asp Thr Ser Trp Gly Ser Gly
    450                 455                 460

Cys Ala Lys Ala Tyr Arg Pro Gly Val Tyr Gly Asn Val Met Val Phe
465                 470                 475                 480

Thr Asp Trp Ile Tyr Arg Gln Met Arg Ala Asp Gly
                485                 490
```

<210> 72
<211> 2448
<212> PRT
<213> Homo sapiens

<400> 72

```
Met Ser Val Gly Arg Arg Lys Leu Ala Leu Leu Trp Ala Leu Ala Leu
1               5                   10                  15

Ala Leu Ala Cys Thr Arg His Thr Gly His Ala Gln Asp Gly Ser Ser
            20                  25                  30

Glu Ser Ser Tyr Lys His His Pro Ala Leu Ser Pro Ile Ala Arg Gly
        35                  40                  45

Pro Ser Gly Val Pro Leu Arg Gly Ala Thr Val Phe Pro Ser Leu Arg
    50                  55                  60

Thr Ile Pro Val Val Arg Ala Ser Asn Pro Ala His Asn Gly Arg Val
65                  70                  75                  80

Cys Ser Thr Trp Gly Ser Phe His Tyr Lys Thr Phe Asp Gly Asp Val
                85                  90                  95

Phe Arg Phe Pro Gly Leu Cys Asn Tyr Val Phe Ser Glu His Cys Gly
            100                 105                 110

Ala Ala Tyr Glu Asp Phe Asn Ile Gln Leu Arg Arg Ser Gln Glu Ser
        115                 120                 125
```

```
Ala Ala Pro Thr Leu Ser Arg Val Leu Met Lys Val Asp Gly Val Val
    130                 135                 140

Ile Gln Leu Thr Lys Gly Ser Val Leu Val Asn Gly His Pro Val Leu
145                 150                 155                 160

Leu Pro Phe Ser Gln Ser Gly Val Leu Ile Gln Gln Ser Ser Ser Tyr
                165                 170                 175

Thr Lys Val Glu Ala Arg Leu Gly Leu Val Leu Met Trp Asn His Asp
            180                 185                 190

Asp Ser Leu Leu Leu Glu Leu Asp Thr Lys Tyr Ala Asn Lys Thr Cys
        195                 200                 205

Gly Leu Cys Gly Asp Phe Asn Gly Met Pro Val Val Ser Glu Leu Leu
    210                 215                 220

Ser His Asn Thr Lys Leu Thr Pro Met Glu Phe Gly Asn Leu Gln Lys
225                 230                 235                 240

Met Asp Asp Pro Thr Glu Gln Cys Gln Asp Pro Val Pro Glu Pro Pro
                245                 250                 255

Arg Asn Cys Ser Thr Gly Phe Gly Ile Cys Glu Glu Leu Leu His Gly
            260                 265                 270

Gln Leu Phe Ser Gly Cys Val Ala Leu Val Asp Val Gly Ser Tyr Leu
        275                 280                 285

Glu Ala Cys Arg Gln Asp Leu Cys Phe Cys Glu Asp Thr Asp Leu Leu
    290                 295                 300

Ser Cys Val Cys His Thr Leu Ala Glu Tyr Ser Arg Gln Cys Thr His
305                 310                 315                 320

Ala Gly Gly Leu Pro Gln Asp Trp Arg Gly Pro Asp Phe Cys Pro Gln
                325                 330                 335

Lys Cys Pro Asn Asn Met Gln Tyr His Glu Cys Arg Ser Pro Cys Ala
            340                 345                 350

Asp Thr Cys Ser Asn Gln Glu His Ser Arg Ala Cys Glu Asp His Cys
        355                 360                 365

Val Ala Gly Cys Phe Cys Pro Glu Gly Thr Val Leu Asp Asp Ile Gly
```

370 375 380

Gln Thr Gly Cys Val Pro Val Ser Lys Cys Ala Cys Val Tyr Asn Gly
385 390 395 400

Ala Ala Tyr Ala Pro Gly Ala Thr Tyr Ser Thr Asp Cys Thr Asn Cys
405 410 415

Thr Cys Ser Gly Gly Arg Trp Ser Cys Gln Glu Val Pro Cys Pro Asp
420 425 430

Thr Cys Ser Val Leu Gly Gly Ala His Phe Ser Thr Phe Asp Gly Lys
435 440 445

Gln Tyr Thr Val His Gly Asp Cys Ser Tyr Val Leu Thr Lys Pro Cys
450 455 460

Asp Ser Ser Ala Phe Thr Val Leu Ala Glu Leu Arg Arg Cys Gly Leu
465 470 475 480

Thr Asp Ser Glu Thr Cys Leu Lys Ser Val Thr Leu Ser Leu Asp Gly
485 490 495

Ala Gln Thr Val Val Val Ile Lys Ala Ser Gly Glu Val Phe Leu Asn
500 505 510

Gln Ile Tyr Thr Gln Leu Pro Ile Ser Ala Ala Asn Val Thr Ile Phe
515 520 525

Arg Pro Ser Thr Phe Phe Ile Ile Ala Gln Thr Ser Leu Gly Leu Gln
530 535 540

Leu Asn Leu Gln Pro Val Pro Thr Met Gln Leu Phe Met Gln Leu Ala
545 550 555 560

Pro Lys Leu Arg Gly Gln Thr Cys Gly Leu Cys Gly Asn Phe Asn Ser
565 570 575

Ile Gln Ala Asp Asp Phe Arg Thr Leu Ser Gly Val Val Glu Ala Thr
580 585 590

Ala Ala Ala Phe Phe Asn Thr Phe Lys Thr Gln Ala Ala Cys Pro Asn
595 600 605

Ile Arg Asn Ser Phe Glu Asp Pro Cys Ser Leu Ser Val Glu Asn Glu
610 615 620

```
Lys Tyr Ala Gln His Trp Cys Ser Gln Leu Thr Asp Ala Asp Gly Pro
625                 630                 635                 640

Phe Gly Arg Cys His Ala Ala Val Lys Pro Gly Thr Tyr Tyr Ser Asn
                645                 650                 655

Cys Val Phe Asp Thr Cys Asn Cys Glu Arg Ser Glu Asp Cys Leu Cys
            660                 665                 670

Ala Ala Leu Ser Ser Tyr Val His Ala Cys Ala Ala Lys Gly Val Gln
        675                 680                 685

Leu Gly Gly Trp Arg Asp Gly Val Cys Thr Lys Pro Met Thr Thr Cys
    690                 695                 700

Pro Lys Ser Met Thr Tyr His Tyr His Val Ser Thr Cys Gln Pro Thr
705                 710                 715                 720

Cys Arg Ser Leu Ser Glu Gly Asp Ile Thr Cys Ser Val Gly Phe Ile
                725                 730                 735

Pro Val Asp Gly Cys Ile Cys Pro Lys Gly Thr Phe Leu Asp Asp Thr
            740                 745                 750

Gly Lys Cys Val Gln Ala Ser Asn Cys Pro Cys Tyr His Arg Gly Ser
        755                 760                 765

Met Ile Pro Asn Gly Glu Ser Val His Asp Ser Gly Ala Ile Cys Thr
    770                 775                 780

Cys Thr His Gly Lys Leu Ser Cys Ile Gly Gly Gln Ala Pro Ala Pro
785                 790                 795                 800

Val Cys Ala Ala Pro Met Val Phe Phe Asp Cys Arg Asn Ala Thr Pro
                805                 810                 815

Gly Asp Thr Gly Ala Gly Cys Gln Lys Ser Cys His Thr Leu Asp Met
            820                 825                 830

Thr Cys Tyr Ser Pro Gln Cys Val Pro Gly Cys Val Cys Pro Asp Gly
        835                 840                 845

Leu Val Ala Asp Gly Glu Gly Gly Cys Ile Thr Ala Glu Asp Cys Pro
    850                 855                 860
```

```
Cys Val His Asn Glu Ala Ser Tyr Arg Ala Gly Gln Thr Ile Arg Val
865                 870                 875                 880

Gly Cys Asn Thr Cys Thr Cys Asp Ser Arg Met Trp Arg Cys Thr Asp
                885                 890                 895

Asp Pro Cys Leu Ala Thr Cys Ala Val Tyr Gly Asp Gly His Tyr Leu
            900                 905                 910

Thr Phe Asp Gly Gln Ser Tyr Ser Phe Asn Gly Asp Cys Glu Tyr Thr
        915                 920                 925

Leu Val Gln Asn His Cys Gly Gly Lys Asp Ser Thr Gln Asp Ser Phe
    930                 935                 940

Arg Val Val Thr Glu Asn Val Pro Cys Gly Thr Thr Gly Thr Thr Cys
945                 950                 955                 960

Ser Lys Ala Ile Lys Ile Phe Leu Gly Gly Phe Glu Leu Lys Leu Ser
                965                 970                 975

His Gly Lys Val Glu Val Ile Gly Thr Asp Glu Ser Gln Glu Val Pro
            980                 985                 990

Tyr Thr Ile Gln Gln Met Gly Ile  Tyr Leu Val Val Asp  Thr Asp Ile
        995                 1000                1005

Gly Leu  Val Leu Leu Trp Asp  Lys Lys Thr Ser Ile  Phe Ile Asn     1010
1015                1020

Leu Ser  Pro Glu Phe Lys Gly  Arg Val Cys Gly Leu  Cys Gly Asn
    1025                1030                1035

Phe Asp  Asp Ile Ala Val Asn  Asp Phe Ala Thr Arg  Ser Arg Ser
    1040                1045                1050

Val Val  Gly Asp Val Leu Glu  Phe Gly Asn Ser Trp  Lys Leu Ser
    1055                1060                1065

Pro Ser  Cys Pro Asp Ala Leu  Ala Pro Lys Asp Pro  Cys Thr Ala
    1070                1075                1080

Asn Pro  Phe Arg Lys Ser Trp  Ala Gln Lys Gln Cys  Ser Ile Leu
    1085                1090                1095
```

```
His Gly  Pro Thr Phe Ala Ala  Cys His Ala His Val  Glu Pro Ala
     1100                 1105                 1110

Arg Tyr  Tyr Glu Ala Cys Val  Asn Asp Ala Cys Ala  Cys Asp Ser
     1115                 1120                 1125

Gly Gly  Asp Cys Glu Cys Phe  Cys Thr Ala Val Ala  Ala Tyr Ala
     1130                 1135                 1140

Gln Ala  Cys His Glu Val Gly  Leu Cys Val Cys Leu  Arg Thr Pro
     1145                 1150                 1155

Ser Ile  Cys Pro Leu Phe Cys  Asp Tyr Tyr Asn Pro  Glu Gly Gln
     1160                 1165                 1170

Cys Glu  Trp His Tyr Gln Pro  Cys Gly Val Pro Cys  Leu Arg Thr
     1175                 1180                 1185

Cys Arg  Asn Pro Arg Gly Asp  Cys Leu Arg Asp Val  Arg Gly Leu
     1190                 1195                 1200

Glu Gly  Cys Tyr Pro Lys Cys  Pro Pro Glu Ala Pro  Ile Phe Asp
     1205                 1210                 1215

Glu Asp  Lys Met Gln Cys Val  Ala Thr Cys Pro Thr  Pro Pro Leu
     1220                 1225                 1230

Pro Pro  Arg Cys His Val His  Gly Lys Ser Tyr Arg  Pro Gly Ala
     1235                 1240                 1245

Val Val  Pro Ser Asp Lys Asn  Cys Gln Ser Cys Leu  Cys Thr Glu
     1250                 1255                 1260

Arg Gly  Val Glu Cys Thr Tyr  Lys Ala Glu Ala Cys  Val Cys Thr
     1265                 1270                 1275

Tyr Asn  Gly Gln Arg Phe His  Pro Gly Asp Val Ile  Tyr His Thr
     1280                 1285                 1290

Thr Asp  Gly Thr Gly Gly Cys  Ile Ser Ala Arg Cys  Gly Ala Asn
     1295                 1300                 1305

Gly Thr  Ile Glu Arg Arg Val  Tyr Pro Cys Ser Pro  Thr Thr Pro
     1310                 1315                 1320

Val Pro  Pro Thr Thr Phe Ser  Phe Ser Thr Pro Pro  Leu Val Val
```

```
1325                1330                1335

Ser Ser  Thr His Thr Pro Ser  Asn Gly Pro Ser Ser  Ala His Thr
1340                1345                1350

Gly Pro  Pro Ser Ser Ala Trp  Pro Thr Thr Ala Gly  Thr Ser Pro
1355                1360                1365

Arg Thr  Arg Leu Pro Thr Ala  Ser Ala Ser Leu Pro  Pro Val Cys
1370                1375                1380

Gly Glu  Lys Cys Leu Trp Ser  Pro Trp Met Asp Val  Ser Arg Pro
1385                1390                1395

Gly Arg  Gly Thr Asp Ser Gly  Asp Phe Asp Thr Leu  Glu Asn Leu
1400                1405                1410

Arg Ala  His Gly Tyr Arg Val  Cys Glu Ser Pro Arg  Ser Val Glu
1415                1420                1425

Cys Arg  Ala Glu Asp Ala Pro  Gly Val Pro Leu Arg  Ala Leu Gly
1430                1435                1440

Gln Arg  Val Gln Cys Ser Pro  Asp Val Gly Leu Thr  Cys Arg Asn
1445                1450                1455

Arg Glu  Gln Ala Ser Gly Leu  Cys Tyr Asn Tyr Gln  Ile Arg Val
1460                1465                1470

Gln Cys  Cys Thr Pro Leu Pro  Cys Ser Thr Ser Ser  Ser Pro Ala
1475                1480                1485

Gln Thr  Thr Pro Pro Thr Thr  Ser Lys Thr Thr Glu  Thr Arg Ala
1490                1495                1500

Ser Gly  Ser Ser Ala Pro Ser  Ser Thr Pro Gly Thr  Val Ser Leu
1505                1510                1515

Ser Thr  Ala Arg Thr Thr Pro  Ala Pro Gly Thr Ala  Thr Ser Val
1520                1525                1530

Lys Lys  Thr Phe Ser Thr Pro  Ser Pro Pro Pro Val  Pro Ala Thr
1535                1540                1545

Ser Thr  Ser Ser Met Ser Thr  Thr Ala Pro Gly Thr  Ser Val Val
1550                1555                1560
```

```
Ser Ser  Lys Pro Thr Pro Thr  Glu Pro Ser Thr Ser  Ser Cys Leu
     1565                 1570                 1575

Gln Glu  Leu Cys Thr Trp Thr  Glu Trp Ile Asp Gly  Ser Tyr Pro
     1580                 1585                 1590

Ala Pro  Gly Ile Asn Gly Gly  Asp Phe Asp Thr Phe  Gln Asn Leu
     1595                 1600                 1605

Arg Asp  Glu Gly Tyr Thr Phe  Cys Glu Ser Pro Arg  Ser Val Gln
     1610                 1615                 1620

Cys Arg  Ala Glu Ser Phe Pro  Asn Thr Pro Leu Ala  Asp Leu Gly
     1625                 1630                 1635

Gln Asp  Val Ile Cys Ser His  Thr Glu Gly Leu Ile  Cys Leu Asn
     1640                 1645                 1650

Lys Asn  Gln Leu Pro Pro Ile  Cys Tyr Asn Tyr Glu  Ile Arg Ile
     1655                 1660                 1665

Gln Cys  Cys Glu Thr Val Asn  Val Cys Arg Asp Ile  Thr Arg Leu
     1670                 1675                 1680

Pro Lys  Thr Val Ala Thr Thr  Arg Pro Thr Pro His  Pro Thr Gly
     1685                 1690                 1695

Ala Gln  Thr Gln Thr Thr Phe  Thr Thr His Met Pro  Ser Ala Ser
     1700                 1705                 1710

Thr Glu  Gln Pro Thr Ala Thr  Ser Arg Gly Gly Pro  Thr Ala Thr
     1715                 1720                 1725

Ser Val  Thr Gln Gly Thr His  Thr Thr Leu Val Thr  Arg Asn Cys
     1730                 1735                 1740

His Pro  Arg Cys Thr Trp Thr  Lys Trp Phe Asp Val  Asp Phe Pro
     1745                 1750                 1755

Ser Pro  Gly Pro His Gly Gly  Asp Lys Glu Thr Tyr  Asn Asn Ile
     1760                 1765                 1770

Ile Arg  Ser Gly Glu Lys Ile  Cys Arg Arg Pro Glu  Glu Ile Thr
     1775                 1780                 1785
```

```
Arg Val  Gln Cys Arg Ala Lys  Ser His Pro Glu Val  Ser Ile Glu
    1790                  1795                  1800

His Leu  Gly Gln Val Val Gln  Cys Ser Arg Glu Glu  Gly Leu Val
    1805                  1810                  1815

Cys Arg  Asn Gln Asp Gln Gln  Gly Pro Phe Lys Met  Cys Leu Asn
    1820                  1825                  1830

Tyr Glu  Val Arg Val Leu Cys  Cys Glu Thr Pro Arg  Gly Cys His
    1835                  1840                  1845

Met Thr  Ser Thr Pro Gly Ser  Thr Ser Ser Ser Pro  Ala Gln Thr
    1850                  1855                  1860

Thr Pro  Ser Thr Thr Ser Lys  Thr Thr Glu Ile Gln  Ala Ser Gly
    1865                  1870                  1875

Ser Ser  Ala Pro Ser Ser Thr  Pro Gly Thr Val Ser  Leu Ser Thr
    1880                  1885                  1890

Ala Arg  Thr Thr Pro Ala Pro  Gly Thr Ala Thr Ser  Val Lys Lys
    1895                  1900                  1905

Thr Phe  Ser Thr Pro Ser Pro  Pro Pro Val Pro Ala  Thr Ser Thr
    1910                  1915                  1920

Ser Ser  Met Ser Thr Thr Ala  Pro Gly Thr Ser Val  Val Ser Ser
    1925                  1930                  1935

Lys Pro  Thr Pro Thr Glu Pro  Ser Thr Ser Ser Cys  Leu Gln Glu
    1940                  1945                  1950

Leu Cys  Thr Trp Thr Glu Trp  Ile Asp Gly Ser Tyr  Pro Ala Pro
    1955                  1960                  1965

Gly Ile  Asn Gly Gly Asp Phe  Asp Thr Phe Gln Asn  Leu Arg Asp
    1970                  1975                  1980

Glu Gly  Tyr Thr Phe Cys Glu  Ser Pro Arg Ser Val  Gln Cys Arg
    1985                  1990                  1995

Ala Glu  Ser Phe Pro Asn Thr  Pro Leu Gly Arg Leu  Gly Gln Asp
    2000                  2005                  2010
```

Val Ile Cys Ser His Thr Glu Gly Leu Ile Cys Leu Asn Lys Asn
2015 2020 2025

Gln Leu Pro Pro Ile Cys Tyr Asn Tyr Glu Ile Arg Ile Gln Cys
2030 2035 2040

Cys Glu Thr Val Asn Val Cys Arg Asp Ile Thr Arg Pro Pro Lys
2045 2050 2055

Thr Val Ala Thr Thr Arg Pro Thr Pro His Pro Thr Gly Ala Gln
2060 2065 2070

Thr Gln Thr Thr Phe Thr Thr His Met Pro Ser Ala Ser Thr Glu
2075 2080 2085

Gln Pro Thr Ala Thr Ser Arg Gly Gly Pro Thr Ala Thr Ser Val
2090 2095 2100

Thr Gln Gly Thr His Thr Thr Pro Val Thr Arg Asn Cys His Pro
2105 2110 2115

Arg Cys Thr Trp Thr Thr Trp Phe Asp Val Asp Phe Pro Ser Pro
2120 2125 2130

Gly Pro His Gly Gly Asp Lys Glu Thr Tyr Asn Asn Ile Ile Arg
2135 2140 2145

Ser Gly Glu Lys Ile Cys Arg Arg Pro Glu Glu Ile Thr Arg Leu
2150 2155 2160

Gln Cys Arg Ala Lys Ser His Pro Glu Val Ser Ile Glu His Leu
2165 2170 2175

Gly Gln Val Val Gln Cys Ser Arg Glu Glu Gly Leu Val Cys Arg
2180 2185 2190

Asn Gln Asp Gln Gln Gly Pro Phe Lys Met Cys Leu Asn Ile Glu
2195 2200 2205

Val Arg Val Leu Cys Cys Glu Thr Pro Lys Gly Cys Pro Val Thr
2210 2215 2220

Ser Thr Pro Val Thr Ala Pro Ser Thr Pro Ser Gly Arg Ala Ile
2225 2230 2235

Ser Pro Thr Gln Ser Thr Ser Ser Trp Gln Lys Ser Arg Thr Thr

```
    2240                2245                2250

Thr Leu  Val Thr Thr Ser Thr  Thr Ser Thr Pro Gln  Thr Ser Thr
    2255                2260                2265

Thr Tyr  Ala His Thr Thr Ser  Thr Thr Ser Ala Pro  Thr Ala Arg
    2270                2275                2280

Thr Thr  Ser Ala Pro Thr Thr  Ser Thr Thr Ser Val  Pro Thr Thr
    2285                2290                2295

Ser Thr  Ile Ser Gly Pro Lys  Thr Thr Pro Ser Pro  Val Pro Thr
    2300                2305                2310

Thr Ser  Thr Thr Ser Ala Ala  Thr Thr Ser Thr Ile  Ser Ala Pro
    2315                2320                2325

Thr Thr  Ser Thr Thr Ser Val  Pro Gly Thr Thr Pro  Ser Pro Val
    2330                2335                2340

Leu Thr  Thr Ser Thr Thr Ser  Ala Pro Thr Thr Arg  Thr Thr Ser
    2345                2350                2355

Ala Ser  Pro Ala Gly Thr Thr  Ser Gly Pro Gly Asn  Thr Pro Ser
    2360                2365                2370

Pro Val  Pro Thr Thr Ser Thr  Ile Ser Ala Pro Thr  Thr Ser Ile
    2375                2380                2385

Thr Ser  Ala Pro Thr Thr Ser  Thr Thr Ser Ala Pro  Thr Ser Ser
    2390                2395                2400

Thr Thr  Ser Gly Pro Gly Thr  Thr Pro Ser Pro Val  Pro Thr Thr
    2405                2410                2415

Ser Ile  Thr Ser Ala Pro Thr  Thr Ser Thr Thr Ser  Ala Pro Thr
    2420                2425                2430

Thr Ser  Thr Thr Ser Ala Pro  Thr Thr Ser Thr Thr  Ser Ala Pro
    2435                2440                2445
```

<210> 73
<211> 508
<212> PRT
<213> Homo sapiens

<400> 73

```
Met Gln Arg Leu Leu Thr Pro Val Lys Arg Ile Leu Gln Leu Thr Arg
1               5                  10                  15

Ala Val Gln Glu Thr Ser Leu Thr Pro Ala Arg Leu Leu Pro Val Ala
            20                  25                  30

His Gln Arg Phe Ser Thr Ala Ser Ala Val Pro Leu Ala Lys Thr Asp
        35                  40                  45

Thr Trp Pro Lys Asp Val Gly Ile Leu Ala Leu Glu Val Tyr Phe Pro
    50                  55                  60

Ala Gln Tyr Val Asp Gln Thr Asp Leu Glu Lys Tyr Asn Asn Val Glu
65                  70                  75                  80

Ala Gly Lys Tyr Thr Val Gly Leu Gly Gln Thr Arg Met Gly Phe Cys
                85                  90                  95

Ser Val Gln Glu Asp Ile Asn Ser Leu Cys Leu Thr Val Val Gln Arg
            100                 105                 110

Leu Met Glu Arg Ile Gln Leu Pro Trp Asp Ser Val Gly Arg Leu Glu
        115                 120                 125

Val Gly Thr Glu Thr Ile Ile Asp Lys Ser Lys Ala Val Lys Thr Val
    130                 135                 140

Leu Met Glu Leu Phe Gln Asp Ser Gly Asn Thr Asp Ile Glu Gly Ile
145                 150                 155                 160

Asp Thr Thr Asn Ala Cys Tyr Gly Gly Thr Ala Ser Leu Phe Asn Ala
                165                 170                 175

Ala Asn Trp Met Glu Ser Ser Ser Trp Asp Gly Arg Tyr Ala Met Val
            180                 185                 190

Val Cys Gly Asp Ile Ala Val Tyr Pro Ser Gly Asn Ala Arg Pro Thr
        195                 200                 205

Gly Gly Ala Gly Ala Val Ala Met Leu Ile Gly Pro Lys Ala Pro Leu
    210                 215                 220

Ala Leu Glu Arg Gly Leu Arg Gly Thr His Met Glu Asn Val Tyr Asp
225                 230                 235                 240
```

```
Phe Tyr Lys Pro Asn Leu Ala Ser Glu Tyr Pro Ile Val Asp Gly Lys
                245                 250                 255

Leu Ser Ile Gln Cys Tyr Leu Arg Ala Leu Asp Arg Cys Tyr Thr Ser
            260                 265                 270

Tyr Arg Lys Lys Ile Gln Asn Gln Trp Lys Gln Ala Gly Ser Asp Arg
        275                 280                 285

Pro Phe Thr Leu Asp Asp Leu Gln Tyr Met Ile Phe His Thr Pro Phe
    290                 295                 300

Cys Lys Met Val Gln Lys Ser Leu Ala Arg Leu Met Phe Asn Asp Phe
305                 310                 315                 320

Leu Ser Ala Ser Ser Asp Thr Gln Thr Ser Leu Tyr Lys Gly Leu Glu
                325                 330                 335

Ala Phe Gly Gly Leu Lys Leu Glu Asp Thr Tyr Thr Asn Lys Asp Leu
            340                 345                 350

Asp Lys Ala Leu Leu Lys Ala Ser Gln Asp Met Phe Asp Lys Lys Thr
        355                 360                 365

Lys Ala Ser Leu Tyr Leu Ser Thr His Asn Gly Asn Met Tyr Thr Ser
    370                 375                 380

Ser Leu Tyr Gly Cys Leu Ala Ser Leu Leu Ser His His Ser Ala Gln
385                 390                 395                 400

Glu Leu Ala Gly Ser Arg Ile Gly Ala Phe Ser Tyr Gly Ser Gly Leu
                405                 410                 415

Ala Ala Ser Phe Phe Ser Phe Arg Val Ser Gln Asp Ala Ala Pro Gly
            420                 425                 430

Ser Pro Leu Asp Lys Leu Val Ser Ser Thr Ser Asp Leu Pro Lys Arg
        435                 440                 445

Leu Ala Ser Arg Lys Cys Val Ser Pro Glu Glu Phe Thr Glu Ile Met
    450                 455                 460

Asn Gln Arg Glu Gln Phe Tyr His Lys Val Asn Phe Ser Pro Pro Gly
465                 470                 475                 480

Asp Thr Asn Ser Leu Phe Pro Gly Thr Trp Tyr Leu Glu Arg Val Asp
```

485 490 495

Glu Gln His Arg Arg Lys Tyr Ala Arg Arg Pro Val
500 505

<210> 74
<211> 165
<212> PRT
<213> Homo sapiens

<400> 74

Met Gly Trp Asp Leu Thr Val Lys Met Leu Ala Gly Asn Glu Phe Gln
1 5 10 15

Val Ser Leu Ser Ser Ser Met Ser Val Ser Glu Leu Lys Ala Gln Ile
20 25 30

Thr Gln Lys Ile Gly Val His Ala Phe Gln Gln Arg Leu Ala Val His
35 40 45

Pro Ser Gly Val Ala Leu Gln Asp Arg Val Pro Leu Ala Ser Gln Gly
50 55 60

Leu Gly Pro Gly Ser Thr Val Leu Leu Val Val Asp Lys Cys Asp Glu
65 70 75 80

Pro Leu Ser Ile Leu Val Arg Asn Asn Lys Gly Arg Ser Ser Thr Tyr
85 90 95

Glu Val Arg Leu Thr Gln Thr Val Ala His Leu Lys Gln Gln Val Ser
100 105 110

Gly Leu Glu Gly Val Gln Asp Asp Leu Phe Trp Leu Thr Phe Glu Gly
115 120 125

Lys Pro Leu Glu Asp Gln Leu Pro Leu Gly Glu Tyr Gly Leu Lys Pro
130 135 140

Leu Ser Thr Val Phe Met Asn Leu Arg Leu Arg Gly Gly Gly Thr Glu
145 150 155 160

Pro Gly Gly Arg Ser
165

<210> 75
<211> 480
<212> PRT

<213> Homo sapiens

<400> 75

Met Asn Ala Ser Glu Phe Arg Arg Arg Gly Lys Glu Met Val Asp Tyr
1 5 10 15

Val Ala Asn Tyr Met Glu Gly Ile Glu Gly Arg Gln Val Tyr Pro Asp
20 25 30

Val Glu Pro Gly Tyr Leu Arg Pro Leu Ile Pro Ala Ala Ala Pro Gln
35 40 45

Glu Pro Asp Thr Phe Glu Asp Ile Ile Asn Asp Val Glu Lys Ile Ile
50 55 60

Met Pro Gly Val Thr His Trp His Ser Pro Tyr Phe Phe Ala Tyr Phe
65 70 75 80

Pro Thr Ala Ser Ser Tyr Pro Ala Met Leu Ala Asp Met Leu Cys Gly
85 90 95

Ala Ile Gly Cys Ile Gly Phe Ser Trp Ala Ala Ser Pro Ala Cys Thr
100 105 110

Glu Leu Glu Thr Val Met Met Asp Trp Leu Gly Lys Met Leu Glu Leu
115 120 125

Pro Lys Ala Phe Leu Asn Glu Lys Ala Gly Glu Gly Gly Gly Val Ile
130 135 140

Gln Gly Ser Ala Ser Glu Ala Thr Leu Val Ala Leu Leu Ala Ala Arg
145 150 155 160

Thr Lys Val Ile His Arg Leu Gln Ala Ala Ser Pro Glu Leu Thr Gln
165 170 175

Ala Ala Ile Met Glu Lys Leu Val Ala Tyr Ser Ser Asp Gln Ala His
180 185 190

Ser Ser Val Glu Arg Ala Gly Leu Ile Gly Gly Val Lys Leu Lys Ala
195 200 205

Ile Pro Ser Asp Gly Asn Phe Ala Met Arg Ala Ser Ala Leu Gln Glu
210 215 220

Ala Leu Glu Arg Asp Lys Ala Ala Gly Leu Ile Pro Phe Phe Met Val

225 230 235 240

Ala Thr Leu Gly Thr Thr Thr Cys Cys Ser Phe Asp Asn Leu Leu Glu
245 250 255

Val Gly Pro Ile Cys Asn Lys Glu Asp Ile Trp Leu His Val Asp Ala
260 265 270

Ala Tyr Ala Gly Ser Ala Phe Ile Cys Pro Glu Phe Arg His Leu Leu
275 280 285

Asn Gly Val Glu Phe Ala Asp Ser Phe Asn Phe Asn Pro His Lys Trp
290 295 300

Leu Leu Val Asn Phe Asp Cys Ser Ala Met Trp Val Lys Lys Arg Thr
305 310 315 320

Asp Leu Thr Gly Ala Phe Arg Leu Asp Pro Thr Tyr Leu Lys His Ser
325 330 335

His Gln Asp Ser Gly Leu Ile Thr Asp Tyr Arg His Trp Gln Ile Pro
340 345 350

Leu Gly Arg Arg Phe Arg Ser Leu Lys Met Trp Phe Val Phe Arg Met
355 360 365

Tyr Gly Val Lys Gly Leu Gln Ala Tyr Ile Arg Lys His Val Gln Leu
370 375 380

Ser His Glu Phe Glu Ser Leu Val Arg Gln Asp Pro Arg Phe Glu Ile
385 390 395 400

Cys Val Glu Val Ile Leu Gly Leu Val Cys Phe Arg Leu Lys Gly Ser
405 410 415

Asn Lys Val Asn Glu Ala Leu Leu Gln Arg Ile Asn Ser Ala Lys Lys
420 425 430

Ile His Leu Val Pro Cys His Leu Arg Asp Lys Phe Val Leu Arg Phe
435 440 445

Ala Ile Cys Ser Arg Thr Val Glu Ser Ala His Val Gln Arg Ala Trp
450 455 460

Glu His Ile Lys Glu Leu Ala Ala Asp Val Leu Arg Ala Glu Arg Glu
465 470 475 480

<210> 76
<211> 402
<212> PRT
<213> Homo sapiens

<400> 76

Met Gln Met Ser Pro Ala Leu Thr Cys Leu Val Leu Gly Leu Ala Leu
1 5 10 15

Val Phe Gly Glu Gly Ser Ala Val His His Pro Pro Ser Tyr Val Ala
20 25 30

His Leu Ala Ser Asp Phe Gly Val Arg Val Phe Gln Gln Val Ala Gln
35 40 45

Ala Ser Lys Asp Arg Asn Val Val Phe Ser Pro Tyr Gly Val Ala Ser
50 55 60

Val Leu Ala Met Leu Gln Leu Thr Thr Gly Gly Glu Thr Gln Gln Gln
65 70 75 80

Ile Gln Ala Ala Met Gly Phe Lys Ile Asp Asp Lys Gly Met Ala Pro
85 90 95

Ala Leu Arg His Leu Tyr Lys Glu Leu Met Gly Pro Trp Asn Lys Asp
100 105 110

Glu Ile Ser Thr Thr Asp Ala Ile Phe Val Gln Arg Asp Leu Lys Leu
115 120 125

Val Gln Gly Phe Met Pro His Phe Phe Arg Leu Phe Arg Ser Thr Val
130 135 140

Lys Gln Val Asp Phe Ser Glu Val Glu Arg Ala Arg Phe Ile Ile Asn
145 150 155 160

Asp Trp Val Lys Thr His Thr Lys Gly Met Ile Ser Asn Leu Leu Gly
165 170 175

Lys Gly Ala Val Asp Gln Leu Thr Arg Leu Val Leu Val Asn Ala Leu
180 185 190

Tyr Phe Asn Gly Gln Trp Lys Thr Pro Phe Pro Asp Ser Ser Thr His
195 200 205

Arg Arg Leu Phe His Lys Ser Asp Gly Ser Thr Val Ser Val Pro Met

210 215 220

Met Ala Gln Thr Asn Lys Phe Asn Tyr Thr Glu Phe Thr Thr Pro Asp
225 230 235 240

Gly His Tyr Tyr Asp Ile Leu Glu Leu Pro Tyr His Gly Asp Thr Leu
245 250 255

Ser Met Phe Ile Ala Ala Pro Tyr Glu Lys Glu Val Pro Leu Ser Ala
260 265 270

Leu Thr Asn Ile Leu Ser Ala Gln Leu Ile Ser His Trp Lys Gly Asn
275 280 285

Met Thr Arg Leu Pro Arg Leu Leu Val Leu Pro Lys Phe Ser Leu Glu
290 295 300

Thr Glu Val Asp Leu Arg Lys Pro Leu Glu Asn Leu Gly Met Thr Asp
305 310 315 320

Met Phe Arg Gln Phe Gln Ala Asp Phe Thr Ser Leu Ser Asp Gln Glu
325 330 335

Pro Leu His Val Ala Gln Ala Leu Gln Lys Val Lys Ile Glu Val Asn
340 345 350

Glu Ser Gly Thr Val Ala Ser Ser Ser Thr Ala Val Ile Val Ser Ala
355 360 365

Arg Met Ala Pro Glu Glu Ile Ile Met Asp Arg Pro Phe Leu Phe Val
370 375 380

Val Arg His Asn Pro Thr Gly Thr Val Leu Phe Met Gly Gln Val Met
385 390 395 400

Glu Pro

<210> 77
<211> 87
<212> PRT
<213> Homo sapiens

<400> 77

Met Gln Lys Val Thr Leu Gly Leu Leu Val Phe Leu Ala Gly Phe Pro
1 5 10 15

Val Leu Asp Ala Asn Asp Leu Glu Asp Lys Asn Ser Pro Phe Tyr Tyr
20 25 30

Asp Trp His Ser Leu Gln Val Gly Gly Leu Ile Cys Ala Gly Val Leu
35 40 45

Cys Ala Met Gly Ile Ile Ile Val Met Ser Ala Lys Cys Lys Cys Lys
50 55 60

Phe Gly Gln Lys Ser Gly His His Pro Gly Glu Thr Pro Pro Leu Ile
65 70 75 80

Thr Pro Gly Ser Ala Gln Ser
85

<210> 78
<211> 317
<212> PRT
<213> Homo sapiens

<400> 78

Met Thr Ser Arg Thr Arg Val Thr Trp Pro Ser Pro Pro Arg Pro Leu
1 5 10 15

Pro Val Pro Ala Ala Ala Ala Val Ala Phe Gly Ala Lys Gly Thr Asp
20 25 30

Pro Ala Glu Ala Arg Ser Ser Arg Gly Ile Glu Glu Ala Gly Pro Arg
35 40 45

Ala His Gly Arg Ala Gly Arg Glu Pro Glu Arg Arg Arg Ser Arg Gln
50 55 60

Gln Arg Arg Gly Gly Leu Gln Ala Arg Arg Ser Thr Leu Leu Lys Thr
65 70 75 80

Cys Ala Arg Ala Arg Ala Thr Ala Pro Gly Ala Met Lys Met Val Ala
85 90 95

Pro Trp Thr Arg Phe Tyr Ser Asn Ser Cys Cys Leu Cys Cys His Val
100 105 110

Arg Thr Gly Thr Ile Leu Leu Gly Val Trp Tyr Leu Ile Ile Asn Ala
115 120 125

Val Val Leu Leu Ile Leu Leu Ser Ala Leu Ala Asp Pro Asp Gln Tyr

130 135 140

Asn Phe Ser Ser Ser Glu Leu Gly Gly Asp Phe Glu Phe Met Asp Asp
145 150 155 160

Ala Asn Met Cys Ile Ala Ile Ala Ile Ser Leu Leu Met Ile Leu Ile
165 170 175

Cys Ala Met Ala Thr Tyr Gly Ala Tyr Lys Gln Arg Ala Ala Trp Ile
180 185 190

Ile Pro Phe Phe Cys Tyr Gln Ile Phe Asp Phe Ala Leu Asn Met Leu
195 200 205

Val Ala Ile Thr Val Leu Ile Tyr Pro Asn Ser Ile Gln Glu Tyr Ile
210 215 220

Arg Gln Leu Pro Pro Asn Phe Pro Tyr Arg Asp Asp Val Met Ser Val
225 230 235 240

Asn Pro Thr Cys Leu Val Leu Ile Ile Leu Leu Phe Ile Ser Ile Ile
245 250 255

Leu Thr Phe Lys Gly Tyr Leu Ile Ser Cys Val Trp Asn Cys Tyr Arg
260 265 270

Tyr Ile Asn Gly Arg Asn Ser Ser Asp Val Leu Val Tyr Val Thr Ser
275 280 285

Asn Asp Thr Thr Val Leu Leu Pro Pro Tyr Asp Asp Ala Thr Val Asn
290 295 300

Gly Ala Ala Lys Glu Pro Pro Pro Pro Tyr Val Ser Ala
305 310 315

<210> 79
<211> 117
<212> PRT
<213> Homo sapiens
<400> 79

Met Arg Ala Ser Ser Phe Leu Ile Val Val Val Phe Leu Ile Ala Gly
1 5 10 15

Thr Leu Val Leu Glu Ala Ala Val Thr Gly Val Pro Val Lys Gly Gln
20 25 30

```
Asp Thr Val Lys Gly Arg Val Pro Phe Asn Gly Gln Asp Pro Val Lys
        35                  40                  45

Gly Gln Val Ser Val Lys Gly Gln Asp Lys Val Lys Ala Gln Glu Pro
    50                  55                  60

Val Lys Gly Pro Val Ser Thr Lys Pro Gly Ser Cys Pro Ile Ile Leu
65                  70                  75                  80

Ile Arg Cys Ala Met Leu Asn Pro Pro Asn Arg Cys Leu Lys Asp Thr
                85                  90                  95

Asp Cys Pro Gly Ile Lys Lys Cys Cys Glu Gly Ser Cys Gly Met Ala
            100                 105                 110

Cys Phe Val Pro Gln
        115
```

<210> 80
<211> 364
<212> PRT
<213> Homo sapiens

<400> 80

```
Met Val Val Pro Ser Leu Lys Leu Gln Asp Leu Ile Glu Glu Ile Arg
1               5                   10                  15

Gly Ala Lys Thr Gln Ala Gln Glu Arg Glu Val Ile Gln Lys Glu Cys
            20                  25                  30

Ala His Ile Arg Ala Ser Phe Arg Asp Gly Asp Pro Val His Arg His
        35                  40                  45

Arg Gln Leu Ala Lys Leu Leu Tyr Val His Met Leu Gly Tyr Pro Ala
    50                  55                  60

His Phe Gly Gln Met Glu Cys Leu Lys Leu Ile Ala Ser Ser Arg Phe
65                  70                  75                  80

Thr Asp Lys Arg Val Gly Tyr Leu Gly Ala Met Leu Leu Leu Asp Glu
                85                  90                  95

Arg His Asp Ala His Leu Leu Ile Thr Asn Ser Ile Lys Asn Asp Leu
            100                 105                 110

Ser Gln Gly Ile Gln Pro Val Gln Gly Leu Ala Leu Cys Thr Leu Ser
        115                 120                 125
```

```
Thr Met Gly Ser Ala Glu Met Cys Arg Asp Leu Ala Pro Glu Val Glu
    130                 135                 140

Lys Leu Leu Leu Gln Pro Ser Pro Tyr Val Arg Lys Lys Ala Ile Leu
145                 150                 155                 160

Thr Ala Val His Met Ile Arg Lys Val Pro Glu Leu Ser Ser Val Phe
                165                 170                 175

Leu Pro Pro Cys Ala Gln Leu Leu His Glu Arg His His Gly Ile Leu
            180                 185                 190

Leu Gly Thr Ile Thr Leu Ile Thr Glu Leu Cys Glu Arg Ser Pro Ala
        195                 200                 205

Ala Leu Arg His Phe Arg Lys Val Val Pro Gln Leu Val His Ile Leu
    210                 215                 220

Arg Thr Leu Val Thr Met Gly Tyr Ser Thr Glu His Ser Ile Ser Gly
225                 230                 235                 240

Val Ser Asp Pro Phe Leu Gln Val Gln Ile Leu Arg Leu Leu Arg Ile
                245                 250                 255

Leu Gly Arg Asn His Glu Glu Ser Ser Glu Thr Met Asn Asp Leu Leu
260                 265                 270

Ala Gln Val Ala Thr Asn Thr Asp Thr Ser Arg Asn Ala Gly Asn Ala
        275                 280                 285

Val Leu Phe Glu Thr Val Leu Thr Ile Met Asp Ile Arg Ser Ala Ala
    290                 295                 300

Gly Leu Arg Val Leu Ala Val Asn Ile Leu Gly Arg Phe Leu Leu Asn
305                 310                 315                 320

Ser Asp Arg Asn Ile Arg Tyr Val Ala Leu Thr Ser Leu Leu Arg Leu
                325                 330                 335

Val Gln Ser Asp His Ser Ala Val Gln Arg His Arg Pro Thr Val Val
            340                 345                 350

Glu Cys Leu Arg Glu Thr Asp Ala Ser Leu Ser Arg
        355                 360
```

<210> 81
<211> 806
<212> PRT
<213> Homo sapiens

<400> 81

Met Gly Ala Pro Ala Cys Ala Leu Ala Leu Cys Val Ala Val Ala Ile
1 5 10 15

Val Ala Gly Ala Ser Ser Glu Ser Leu Gly Thr Glu Gln Arg Val Val
20 25 30

Gly Arg Ala Ala Glu Val Pro Gly Pro Glu Pro Gly Gln Gln Glu Gln
35 40 45

Leu Val Phe Gly Ser Gly Asp Ala Val Glu Leu Ser Cys Pro Pro Pro
50 55 60

Gly Gly Gly Pro Met Gly Pro Thr Val Trp Val Lys Asp Gly Thr Gly
65 70 75 80

Leu Val Pro Ser Glu Arg Val Leu Val Gly Pro Gln Arg Leu Gln Val
85 90 95

Leu Asn Ala Ser His Glu Asp Ser Gly Ala Tyr Ser Cys Arg Gln Arg
100 105 110

Leu Thr Gln Arg Val Leu Cys His Phe Ser Val Arg Val Thr Asp Ala
115 120 125

Pro Ser Ser Gly Asp Asp Glu Asp Gly Glu Asp Glu Ala Glu Asp Thr
130 135 140

Gly Val Asp Thr Gly Ala Pro Tyr Trp Thr Arg Pro Glu Arg Met Asp
145 150 155 160

Lys Lys Leu Leu Ala Val Pro Ala Ala Asn Thr Val Arg Phe Arg Cys
165 170 175

Pro Ala Ala Gly Asn Pro Thr Pro Ser Ile Ser Trp Leu Lys Asn Gly
180 185 190

Arg Glu Phe Arg Gly Glu His Arg Ile Gly Gly Ile Lys Leu Arg His
195 200 205

Gln Gln Trp Ser Leu Val Met Glu Ser Val Val Pro Ser Asp Arg Gly

```
    210                 215                 220

Asn Tyr Thr Cys Val Val Glu Asn Lys Phe Gly Ser Ile Arg Gln Thr
225                 230                 235                 240

Tyr Thr Leu Asp Val Leu Glu Arg Ser Pro His Arg Pro Ile Leu Gln
                245                 250                 255

Ala Gly Leu Pro Ala Asn Gln Thr Ala Val Leu Gly Ser Asp Val Glu
            260                 265                 270

Phe His Cys Lys Val Tyr Ser Asp Ala Gln Pro His Ile Gln Trp Leu
        275                 280                 285

Lys His Val Glu Val Asn Gly Ser Lys Val Gly Pro Asp Gly Thr Pro
    290                 295                 300

Tyr Val Thr Val Leu Lys Thr Ala Gly Ala Asn Thr Thr Asp Lys Glu
305                 310                 315                 320

Leu Glu Val Leu Ser Leu His Asn Val Thr Phe Glu Asp Ala Gly Glu
                325                 330                 335

Tyr Thr Cys Leu Ala Gly Asn Ser Ile Gly Phe Ser His His Ser Ala
            340                 345                 350

Trp Leu Val Val Leu Pro Ala Glu Glu Glu Leu Val Glu Ala Asp Glu
        355                 360                 365

Ala Gly Ser Val Tyr Ala Gly Ile Leu Ser Tyr Gly Val Gly Phe Phe
    370                 375                 380

Leu Phe Ile Leu Val Val Ala Ala Val Thr Leu Cys Arg Leu Arg Ser
385                 390                 395                 400

Pro Pro Lys Lys Gly Leu Gly Ser Pro Thr Val His Lys Ile Ser Arg
                405                 410                 415

Phe Pro Leu Lys Arg Gln Val Ser Leu Glu Ser Asn Ala Ser Met Ser
            420                 425                 430

Ser Asn Thr Pro Leu Val Arg Ile Ala Arg Leu Ser Ser Gly Glu Gly
        435                 440                 445

Pro Thr Leu Ala Asn Val Ser Glu Leu Glu Leu Pro Ala Asp Pro Lys
    450                 455                 460
```

```
Trp Glu Leu Ser Arg Ala Arg Leu Thr Leu Gly Lys Pro Leu Gly Glu
465                 470                 475                 480

Gly Cys Phe Gly Gln Val Val Met Ala Glu Ala Ile Gly Ile Asp Lys
                485                 490                 495

Asp Arg Ala Ala Lys Pro Val Thr Val Ala Val Lys Met Leu Lys Asp
            500                 505                 510

Asp Ala Thr Asp Lys Asp Leu Ser Asp Leu Val Ser Glu Met Glu Met
        515                 520                 525

Met Lys Met Ile Gly Lys His Lys Asn Ile Ile Asn Leu Leu Gly Ala
    530                 535                 540

Cys Thr Gln Gly Gly Pro Leu Tyr Val Leu Val Glu Tyr Ala Ala Lys
545                 550                 555                 560

Gly Asn Leu Arg Glu Phe Leu Arg Ala Arg Arg Pro Pro Gly Leu Asp
                565                 570                 575

Tyr Ser Phe Asp Thr Cys Lys Pro Pro Glu Glu Gln Leu Thr Phe Lys
            580                 585                 590

Asp Leu Val Ser Cys Ala Tyr Gln Val Ala Arg Gly Met Glu Tyr Leu
        595                 600                 605

Ala Ser Gln Lys Cys Ile His Arg Asp Leu Ala Ala Arg Asn Val Leu
    610                 615                 620

Val Thr Glu Asp Asn Val Met Lys Ile Ala Asp Phe Gly Leu Ala Arg
625                 630                 635                 640

Asp Val His Asn Leu Asp Tyr Tyr Lys Lys Thr Thr Asn Gly Arg Leu
                645                 650                 655

Pro Val Lys Trp Met Ala Pro Glu Ala Leu Phe Asp Arg Val Tyr Thr
            660                 665                 670

His Gln Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu Ile Phe
        675                 680                 685

Thr Leu Gly Gly Ser Pro Tyr Pro Gly Ile Pro Val Glu Glu Leu Phe
    690                 695                 700
```

```
Lys Leu Leu Lys Glu Gly His Arg Met Asp Lys Pro Ala Asn Cys Thr
705                 710                 715                 720

His Asp Leu Tyr Met Ile Met Arg Glu Cys Trp His Ala Ala Pro Ser
                725                 730                 735

Gln Arg Pro Thr Phe Lys Gln Leu Val Glu Asp Leu Asp Arg Val Leu
            740                 745                 750

Thr Val Thr Ser Thr Asp Glu Tyr Leu Asp Leu Ser Ala Pro Phe Glu
        755                 760                 765

Gln Tyr Ser Pro Gly Gly Gln Asp Thr Pro Ser Ser Ser Ser Ser Gly
    770                 775                 780

Asp Asp Ser Val Phe Ala His Asp Leu Leu Pro Pro Ala Pro Pro Ser
785                 790                 795                 800

Ser Gly Gly Ser Arg Thr
                805
```

<210> 82
<211> 387
<212> PRT
<213> Homo sapiens

<400> 82

```
Met Glu Lys Lys Asp Leu Gly Pro Lys Pro Ala Leu Ile Gly His Arg
1               5                   10                  15

Gly Ala Pro Met Leu Ala Pro Glu His Thr Leu Met Ser Phe Arg Lys
            20                  25                  30

Ala Leu Glu Gln Lys Leu Tyr Gly Leu Gln Ala Asp Ile Thr Ile Ser
        35                  40                  45

Leu Asp Gly Val Pro Phe Leu Met His Asp Thr Thr Leu Arg Arg Thr
    50                  55                  60

Thr Asn Val Glu Glu Glu Phe Pro Glu Leu Ala Arg Arg Pro Ala Ser
65                  70                  75                  80

Met Leu Asn Trp Thr Thr Leu Gln Arg Leu Asn Ala Gly Gln Trp Phe
                85                  90                  95

Leu Lys Thr Asp Pro Phe Trp Thr Ala Ser Ser Leu Ser Pro Ser Asp
```

100 105 110

His Arg Glu Ala Gln Asn Gln Ser Ile Cys Ser Leu Ala Glu Leu Leu
115 120 125

Glu Leu Ala Lys Gly Asn Ala Thr Leu Leu Leu Asn Leu Arg Asp Pro
130 135 140

Pro Arg Glu His Pro Tyr Arg Ser Ser Phe Ile Asn Val Thr Leu Glu
145 150 155 160

Ala Val Leu His Ser Gly Phe Pro Gln His Gln Val Met Trp Leu Pro
165 170 175

Ser Arg Gln Arg Pro Leu Val Arg Lys Val Ala Pro Gly Phe Gln Gln
180 185 190

Thr Ser Gly Ser Lys Glu Ala Val Ala Ser Leu Arg Arg Gly His Ile
195 200 205

Gln Arg Leu Asn Leu Arg Tyr Thr Gln Val Ser Arg Gln Glu Leu Arg
210 215 220

Asp Tyr Ala Ser Trp Asn Leu Ser Val Asn Leu Tyr Thr Val Asn Ala
225 230 235 240

Pro Trp Leu Phe Ser Leu Leu Trp Cys Ala Gly Val Pro Ser Val Thr
245 250 255

Ser Asp Asn Ser His Thr Leu Ser Gln Val Pro Ser Pro Leu Trp Ile
260 265 270

Met Pro Pro Asp Glu Tyr Cys Leu Met Trp Val Thr Ala Asp Leu Val
275 280 285

Ser Phe Thr Leu Ile Val Gly Ile Phe Val Leu Gln Lys Trp Arg Leu
290 295 300

Gly Gly Ile Arg Ser Tyr Asn Pro Glu Gln Ile Met Leu Ser Ala Ala
305 310 315 320

Val Arg Arg Thr Ser Arg Asp Val Ser Ile Met Lys Glu Lys Leu Ile
325 330 335

Phe Ser Glu Ile Ser Asp Gly Val Glu Val Ser Asp Val Leu Ser Val
340 345 350

```
Cys Ser Asp Asn Ser Tyr Asp Thr Tyr Ala Asn Ser Thr Ala Thr Pro
        355                 360                 365

Val Gly Pro Arg Gly Gly Gly Ser His Thr Lys Thr Leu Ile Glu Arg
    370                 375                 380

Ser Gly Arg
385
```

<210> 83
<211> 117
<212> PRT
<213> Homo sapiens

<400> 83

```
Met Arg Ala Ser Ser Phe Leu Ile Val Val Val Phe Leu Ile Ala Gly
1               5                   10                  15

Thr Leu Val Leu Glu Ala Ala Val Thr Gly Val Pro Val Lys Gly Gln
            20                  25                  30

Asp Thr Val Lys Gly Arg Val Pro Phe Asn Gly Gln Asp Pro Val Lys
        35                  40                  45

Gly Gln Val Ser Val Lys Gly Gln Asp Lys Val Lys Ala Gln Glu Pro
    50                  55                  60

Val Lys Gly Pro Val Ser Thr Lys Pro Gly Ser Cys Pro Ile Ile Leu
65                  70                  75                  80

Ile Arg Cys Ala Met Leu Asn Pro Pro Asn Arg Cys Leu Lys Asp Thr
                85                  90                  95

Asp Cys Pro Gly Ile Lys Lys Cys Cys Glu Gly Ser Cys Gly Met Ala
            100                 105                 110

Cys Phe Val Pro Gln
        115
```

<210> 84
<211> 1684
<212> PRT
<213> Homo sapiens

<400> 84

```
Met Leu Gly Thr Ile Thr Ile Thr Val Gly Gln Arg Asp Ser Glu Asp
```

```
1               5                   10                  15

Val Ser Lys Arg Asp Ser Asp Lys Glu Met Ala Thr Lys Ser Ala Val
            20                  25                  30

Val His Asp Ile Thr Asp Asp Gly Gln Glu Glu Thr Pro Glu Ile Ile
        35                  40                  45

Glu Gln Ile Pro Ser Ser Glu Ser Asn Leu Glu Glu Leu Thr Gln Pro
    50                  55                  60

Thr Glu Ser Gln Ala Asn Asp Ile Gly Phe Lys Lys Val Phe Lys Phe
65                  70                  75                  80

Val Gly Phe Lys Phe Thr Val Lys Lys Asp Lys Thr Glu Lys Pro Asp
                85                  90                  95

Thr Val Gln Leu Leu Thr Val Lys Lys Asp Glu Gly Glu Gly Ala Ala
            100                 105                 110

Gly Ala Gly Asp His Lys Asp Pro Ser Leu Gly Ala Gly Glu Ala Ala
        115                 120                 125

Ser Lys Glu Ser Glu Pro Lys Gln Ser Thr Glu Lys Pro Glu Glu Thr
    130                 135                 140

Leu Lys Arg Glu Gln Ser His Ala Glu Ile Ser Pro Pro Ala Glu Ser
145                 150                 155                 160

Gly Gln Ala Val Glu Glu Cys Lys Glu Glu Gly Glu Glu Lys Gln Glu
                165                 170                 175

Lys Glu Pro Ser Lys Ser Ala Glu Ser Pro Thr Ser Pro Val Thr Ser
            180                 185                 190

Glu Thr Gly Ser Thr Phe Lys Lys Phe Phe Thr Gln Gly Trp Ala Gly
        195                 200                 205

Trp Arg Lys Lys Thr Ser Phe Arg Lys Pro Lys Glu Asp Glu Val Glu
    210                 215                 220

Ala Ser Glu Lys Lys Lys Glu Gln Glu Pro Glu Lys Val Asp Thr Glu
225                 230                 235                 240

Glu Asp Gly Lys Ala Glu Val Ala Ser Glu Lys Leu Thr Ala Ser Glu
                245                 250                 255
```

```
Gln Ala His Pro Gln Glu Pro Ala Glu Ser Ala His Glu Pro Arg Leu
            260                 265                 270

Ser Ala Glu Tyr Glu Lys Val Glu Leu Pro Ser Glu Glu Gln Val Ser
        275                 280                 285

Gly Ser Gln Gly Pro Ser Glu Glu Lys Pro Ala Pro Leu Ala Thr Glu
    290                 295                 300

Val Phe Asp Glu Lys Ile Glu Val His Gln Glu Glu Val Val Ala Glu
305                 310                 315                 320

Val His Val Ser Thr Val Glu Glu Arg Thr Glu Glu Gln Lys Thr Glu
                325                 330                 335

Val Glu Glu Thr Ala Gly Ser Val Pro Ala Glu Glu Leu Val Glu Met
            340                 345                 350

Asp Ala Glu Pro Gln Glu Ala Glu Pro Ala Lys Glu Leu Val Lys Leu
        355                 360                 365

Lys Glu Thr Cys Val Ser Gly Glu Asp Pro Thr Gln Gly Ala Asp Leu
    370                 375                 380

Ser Pro Asp Glu Lys Val Leu Ser Lys Pro Pro Glu Gly Val Val Ser
385                 390                 395                 400

Glu Val Glu Met Leu Ser Ser Gln Glu Arg Met Lys Val Gln Gly Ser
                405                 410                 415

Pro Leu Lys Lys Leu Phe Thr Ser Thr Gly Leu Lys Lys Leu Ser Gly
            420                 425                 430

Lys Lys Gln Lys Gly Lys Arg Gly Gly Gly Asp Glu Glu Ser Gly Glu
        435                 440                 445

His Thr Gln Val Pro Ala Asp Ser Pro Asp Ser Gln Glu Glu Gln Lys
    450                 455                 460

Gly Glu Ser Ser Ala Ser Ser Pro Glu Glu Pro Glu Glu Ile Thr Cys
465                 470                 475                 480

Leu Glu Lys Gly Leu Ala Glu Val Gln Gln Asp Gly Glu Ala Glu Glu
                485                 490                 495
```

```
Gly Ala Thr Ser Asp Gly Glu Lys Lys Arg Glu Gly Val Thr Pro Trp
            500                 505                 510

Ala Ser Phe Lys Lys Met Val Thr Pro Lys Lys Arg Val Arg Arg Pro
        515                 520                 525

Ser Glu Ser Asp Lys Glu Asp Glu Leu Asp Lys Val Lys Ser Ala Thr
    530                 535                 540

Leu Ser Ser Thr Glu Ser Thr Ala Ser Glu Met Gln Glu Glu Met Lys
545                 550                 555                 560

Gly Ser Val Glu Glu Pro Lys Pro Glu Glu Pro Lys Arg Lys Val Asp
                565                 570                 575

Thr Ser Val Ser Trp Glu Ala Leu Ile Cys Val Gly Ser Ser Lys Lys
            580                 585                 590

Arg Ala Arg Arg Gly Ser Ser Ser Asp Glu Glu Gly Gly Pro Lys Ala
        595                 600                 605

Met Gly Gly Asp His Gln Lys Ala Asp Glu Ala Gly Lys Asp Lys Glu
    610                 615                 620

Thr Gly Thr Asp Gly Ile Leu Ala Gly Ser Gln Glu His Asp Pro Gly
625                 630                 635                 640

Gln Gly Ser Ser Ser Pro Glu Gln Ala Gly Ser Pro Thr Glu Gly Glu
                645                 650                 655

Gly Val Ser Thr Trp Glu Ser Phe Lys Arg Leu Val Thr Pro Arg Lys
            660                 665                 670

Lys Ser Lys Ser Lys Leu Glu Glu Lys Ser Glu Asp Ser Ile Ala Gly
        675                 680                 685

Ser Gly Val Glu His Ser Thr Pro Asp Thr Glu Pro Gly Lys Glu Glu
    690                 695                 700

Ser Trp Val Ser Ile Lys Lys Phe Ile Pro Gly Arg Arg Lys Lys Arg
705                 710                 715                 720

Pro Asp Gly Lys Gln Glu Gln Ala Pro Val Glu Asp Ala Gly Pro Thr
                725                 730                 735
```

```
Gly Ala Asn Glu Asp Asp Ser Asp Val Pro Ala Val Val Pro Leu Ser
            740                 745                 750

Glu Tyr Asp Ala Val Glu Arg Glu Lys Met Glu Ala Gln Gln Ala Gln
        755                 760                 765

Lys Ser Ala Glu Gln Pro Glu Gln Lys Ala Ala Thr Glu Val Ser Lys
    770                 775                 780

Glu Leu Ser Glu Ser Gln Val His Met Met Ala Ala Ala Val Ala Asp
785                 790                 795                 800

Gly Thr Arg Ala Ala Thr Ile Ile Glu Glu Arg Ser Pro Ser Trp Ile
                805                 810                 815

Ser Ala Ser Val Thr Glu Pro Leu Glu Gln Val Glu Ala Glu Ala Ala
            820                 825                 830

Leu Leu Thr Glu Glu Val Leu Glu Arg Glu Val Ile Ala Glu Glu Glu
        835                 840                 845

Pro Pro Thr Val Thr Glu Pro Leu Pro Glu Asn Arg Glu Ala Arg Gly
    850                 855                 860

Asp Thr Val Val Ser Glu Ala Glu Leu Thr Pro Glu Ala Val Thr Ala
865                 870                 875                 880

Ala Glu Thr Ala Gly Pro Leu Gly Ala Glu Glu Gly Thr Glu Ala Ser
                885                 890                 895

Ala Ala Glu Glu Thr Thr Glu Met Val Ser Ala Val Ser Gln Leu Thr
            900                 905                 910

Asp Ser Pro Asp Thr Thr Glu Glu Ala Thr Pro Val Gln Glu Val Glu
        915                 920                 925

Gly Gly Val Pro Asp Ile Glu Glu Gln Glu Arg Arg Thr Gln Glu Val
    930                 935                 940

Leu Gln Ala Val Ala Glu Lys Val Lys Glu Glu Ser Gln Leu Pro Gly
945                 950                 955                 960

Thr Gly Gly Pro Glu Asp Val Leu Gln Pro Val Gln Arg Ala Glu Ala
                965                 970                 975

Glu Arg Pro Glu Glu Gln Ala Glu Ala Ser Gly Leu Lys Lys Glu Thr
```

980 985 990

Asp Val Val Leu Lys Val Asp Ala Gln Glu Ala Lys Thr Glu Pro Phe
995 1000 1005

Thr Gln Gly Lys Val Val Gly Gln Thr Thr Pro Glu Ser Phe Glu
1010 1015 1020

Lys Ala Pro Gln Val Thr Glu Ser Ile Glu Ser Ser Glu Leu Val
1025 1030 1035

Thr Thr Cys Gln Ala Glu Thr Leu Ala Gly Val Lys Ser Gln Glu
1040 1045 1050

Met Val Met Glu Gln Ala Ile Pro Pro Asp Ser Val Glu Thr Pro
1055 1060 1065

Thr Asp Ser Glu Thr Asp Gly Ser Thr Pro Val Ala Asp Phe Asp
1070 1075 1080

Ala Pro Gly Thr Thr Gln Lys Asp Glu Ile Val Glu Ile His Glu
1085 1090 1095

Glu Asn Glu Val Ala Ser Gly Thr Gln Ser Gly Gly Thr Glu Ala
1100 1105 1110

Glu Ala Val Pro Ala Gln Lys Glu Arg Pro Pro Ala Pro Ser Ser
1115 1120 1125

Phe Val Phe Gln Glu Glu Thr Lys Glu Gln Ser Lys Met Glu Asp
1130 1135 1140

Thr Leu Glu His Thr Asp Lys Glu Val Ser Val Glu Thr Val Ser
1145 1150 1155

Ile Leu Ser Lys Thr Glu Gly Thr Gln Glu Ala Asp Gln Tyr Ala
1160 1165 1170

Asp Glu Lys Thr Lys Asp Val Pro Phe Phe Glu Gly Leu Glu Gly
1175 1180 1185

Ser Ile Asp Thr Gly Ile Thr Val Ser Arg Glu Lys Val Thr Glu
1190 1195 1200

Val Ala Leu Lys Gly Glu Gly Thr Glu Glu Ala Glu Cys Lys Lys
1205 1210 1215

```
Asp Asp  Ala Leu Glu Leu Gln  Ser His Ala Lys Ser  Pro Pro Ser
     1220                 1225                 1230

Pro Val  Glu Arg Glu Met Val  Val Gln Val Glu Arg  Glu Lys Thr
     1235                 1240                 1245

Glu Ala  Glu Pro Thr His Val  Asn Glu Glu Lys Leu  Glu His Glu
     1250                 1255                 1260

Thr Ala  Val Thr Val Ser Glu  Glu Val Ser Lys Gln  Leu Leu Gln
     1265                 1270                 1275

Thr Val  Asn Val Pro Ile Ile  Asp Gly Ala Lys Glu  Val Ser Ser
     1280                 1285                 1290

Leu Glu  Gly Ser Pro Pro Pro  Cys Leu Gly Gln Glu  Glu Ala Val
     1295                 1300                 1305

Cys Thr  Lys Ile Gln Val Gln  Ser Ser Glu Ala Ser  Phe Thr Leu
     1310                 1315                 1320

Thr Ala  Ala Ala Glu Glu Glu  Lys Val Leu Gly Glu  Thr Ala Asn
     1325                 1330                 1335

Ile Leu  Glu Thr Gly Glu Thr  Leu Glu Pro Ala Gly  Ala His Leu
     1340                 1345                 1350

Val Leu  Glu Glu Lys Ser Ser  Glu Lys Asn Glu Asp  Phe Ala Ala
     1355                 1360                 1365

His Pro  Gly Glu Asp Ala Val  Pro Thr Gly Pro Asp  Cys Gln Ala
     1370                 1375                 1380

Lys Ser  Thr Pro Val Ile Val  Ser Ala Thr Thr Lys  Lys Gly Leu
     1385                 1390                 1395

Ser Ser  Asp Leu Glu Gly Glu  Lys Thr Thr Ser Leu  Lys Trp Lys
     1400                 1405                 1410

Ser Asp  Glu Val Asp Glu Gln  Val Ala Cys Gln Glu  Val Lys Val
     1415                 1420                 1425

Ser Val  Ala Ile Glu Asp Leu  Glu Pro Glu Asn Gly  Ile Leu Glu
     1430                 1435                 1440
```

```
Leu Glu  Thr Lys Ser Ser Lys  Leu Val Gln Asn Ile  Ile Gln Thr
    1445                 1450                 1455

Ala Val  Asp Gln Phe Val Arg  Thr Glu Glu Thr Ala  Thr Glu Met
    1460                 1465                 1470

Leu Thr  Ser Glu Leu Gln Thr  Gln Ala His Val Ile  Lys Ala Asp
    1475                 1480                 1485

Ser Gln  Asp Ala Gly Gln Glu  Thr Glu Lys Glu Gly  Glu Glu Pro
    1490                 1495                 1500

Leu Ala  Ser Ala Gln Asp Glu  Thr Pro Ile Thr Ser  Ala Lys Glu
    1505                 1510                 1515

Glu Ser  Glu Ser Thr Ala Val  Gly Gln Ala His Ser  Asp Ile Ser
    1520                 1525                 1530

Lys Asp  Met Ser Glu Ala Ser  Glu Lys Thr Met Thr  Val Glu Val
    1535                 1540                 1545

Glu Gly  Ser Thr Val Asn Asp  Gln Gln Leu Glu Glu  Val Val Leu
    1550                 1555                 1560

Pro Ser  Glu Glu Glu Gly Gly  Gly Ala Gly Thr Lys  Ser Val Pro
    1565                 1570                 1575

Glu Asp  Asp Gly His Ala Leu  Leu Ala Glu Arg Ile  Glu Lys Ser
    1580                 1585                 1590

Leu Val  Glu Pro Lys Glu Asp  Glu Lys Gly Asp Asp  Val Asp Asp
    1595                 1600                 1605

Pro Glu  Asn Gln Asn Ser Ala  Leu Ala Asp Thr Asp  Ala Ser Gly
    1610                 1615                 1620

Gly Leu  Thr Lys Glu Ser Pro  Asp Thr Asn Gly Pro  Lys Gln Lys
    1625                 1630                 1635

Glu Lys  Glu Asp Ala Gln Glu  Val Glu Leu Gln Glu  Gly Lys Val
    1640                 1645                 1650

His Ser  Glu Ser Asp Lys Ala  Ile Thr Pro Gln Ala  Gln Glu Glu
    1655                 1660                 1665
```

Leu Gln Lys Gln Glu Arg Glu Ser Ala Lys Ser Glu Leu Thr Glu
1670 1675 1680

Ser

<210> 85
<211> 1722
<212> PRT
<213> Homo sapiens

<400> 85

Met Arg Thr Gly Trp Ala Thr Pro Arg Arg Pro Ala Gly Leu Leu Met
1 5 10 15

Leu Leu Phe Trp Phe Phe Asp Leu Ala Glu Pro Ser Gly Arg Ala Ala
20 25 30

Asn Asp Pro Phe Thr Ile Val His Gly Asn Thr Gly Lys Cys Ile Lys
35 40 45

Pro Val Tyr Gly Trp Ile Val Ala Asp Asp Cys Asp Glu Thr Glu Asp
50 55 60

Lys Leu Trp Lys Trp Val Ser Gln His Arg Leu Phe His Leu His Ser
65 70 75 80

Gln Lys Cys Leu Gly Leu Asp Ile Thr Lys Ser Val Asn Glu Leu Arg
85 90 95

Met Phe Ser Cys Asp Ser Ser Ala Met Leu Trp Trp Lys Cys Glu His
100 105 110

His Ser Leu Tyr Gly Ala Ala Arg Tyr Arg Leu Ala Leu Lys Asp Gly
115 120 125

His Gly Thr Ala Ile Ser Asn Ala Ser Asp Val Trp Lys Lys Gly Gly
130 135 140

Ser Glu Glu Ser Leu Cys Asp Gln Pro Tyr His Glu Ile Tyr Thr Arg
145 150 155 160

Asp Gly Asn Ser Tyr Gly Arg Pro Cys Glu Phe Pro Phe Leu Ile Asp
165 170 175

Gly Thr Trp His His Asp Cys Ile Leu Asp Glu Asp His Ser Gly Pro
180 185 190

```
Trp Cys Ala Thr Thr Leu Asn Tyr Glu Tyr Asp Arg Lys Trp Gly Ile
        195                 200                 205

Cys Leu Lys Pro Glu Asn Gly Cys Glu Asp Asn Trp Glu Lys Asn Glu
    210                 215                 220

Gln Phe Gly Ser Cys Tyr Gln Phe Asn Thr Gln Thr Ala Leu Ser Trp
225                 230                 235                 240

Lys Glu Ala Tyr Val Ser Cys Gln Asn Gln Gly Ala Asp Leu Leu Ser
                245                 250                 255

Ile Asn Ser Ala Ala Glu Leu Thr Tyr Leu Lys Glu Lys Glu Gly Ile
            260                 265                 270

Ala Lys Ile Phe Trp Ile Gly Leu Asn Gln Leu Tyr Ser Ala Arg Gly
        275                 280                 285

Trp Glu Trp Ser Asp His Lys Pro Leu Asn Phe Leu Asn Trp Asp Pro
    290                 295                 300

Asp Arg Pro Ser Ala Pro Thr Ile Gly Gly Ser Ser Cys Ala Arg Met
305                 310                 315                 320

Asp Ala Glu Ser Gly Leu Trp Gln Ser Phe Ser Cys Glu Ala Gln Leu
                325                 330                 335

Pro Tyr Val Cys Arg Lys Pro Leu Asn Asn Thr Val Glu Leu Thr Asp
            340                 345                 350

Val Trp Thr Tyr Ser Asp Thr Arg Cys Asp Ala Gly Trp Leu Pro Asn
        355                 360                 365

Asn Gly Phe Cys Tyr Leu Leu Val Asn Glu Ser Asn Ser Trp Asp Lys
    370                 375                 380

Ala His Ala Lys Cys Lys Ala Phe Ser Ser Asp Leu Ile Ser Ile His
385                 390                 395                 400

Ser Leu Ala Asp Val Glu Val Val Val Thr Lys Leu His Asn Glu Asp
                405                 410                 415

Ile Lys Glu Glu Val Trp Ile Gly Leu Lys Asn Ile Asn Ile Pro Thr
            420                 425                 430
```

```
Leu Phe Gln Trp Ser Asp Gly Thr Glu Val Thr Leu Thr Tyr Trp Asp
        435                 440                 445

Glu Asn Glu Pro Asn Val Pro Tyr Asn Lys Thr Pro Asn Cys Val Ser
    450                 455                 460

Tyr Leu Gly Glu Leu Gly Gln Trp Lys Val Gln Ser Cys Glu Glu Lys
465                 470                 475                 480

Leu Lys Tyr Val Cys Lys Arg Lys Gly Glu Lys Leu Asn Asp Ala Ser
                485                 490                 495

Ser Asp Lys Met Cys Pro Pro Asp Glu Gly Trp Lys Arg His Gly Glu
            500                 505                 510

Thr Cys Tyr Lys Ile Tyr Glu Asp Glu Val Pro Phe Gly Thr Asn Cys
        515                 520                 525

Asn Leu Thr Ile Thr Ser Arg Phe Glu Gln Glu Tyr Leu Asn Asp Leu
    530                 535                 540

Met Lys Lys Tyr Asp Lys Ser Leu Arg Lys Tyr Phe Trp Thr Gly Leu
545                 550                 555                 560

Arg Asp Val Asp Ser Cys Gly Glu Tyr Asn Trp Ala Thr Val Gly Gly
                565                 570                 575

Arg Arg Arg Ala Val Thr Phe Ser Asn Trp Asn Phe Leu Glu Pro Ala
            580                 585                 590

Ser Pro Gly Gly Cys Val Ala Met Ser Thr Gly Lys Ser Val Gly Lys
        595                 600                 605

Trp Glu Val Lys Asp Cys Arg Ser Phe Lys Ala Leu Ser Ile Cys Lys
    610                 615                 620

Lys Met Ser Gly Pro Leu Gly Pro Glu Glu Ala Ser Pro Lys Pro Asp
625                 630                 635                 640

Asp Pro Cys Pro Glu Gly Trp Gln Ser Phe Pro Ala Ser Leu Ser Cys
                645                 650                 655

Tyr Lys Val Phe His Ala Glu Arg Ile Val Arg Lys Arg Asn Trp Glu
            660                 665                 670
```

```
Glu Ala Glu Arg Phe Cys Gln Ala Leu Gly Ala His Leu Ser Ser Phe
        675                 680                 685

Ser His Val Asp Glu Ile Lys Glu Phe Leu His Phe Leu Thr Asp Gln
    690                 695                 700

Phe Ser Gly Gln His Trp Leu Trp Ile Gly Leu Asn Lys Arg Ser Pro
705                 710                 715                 720

Asp Leu Gln Gly Ser Trp Gln Trp Ser Asp Arg Thr Pro Val Ser Thr
                725                 730                 735

Ile Ile Met Pro Asn Glu Phe Gln Gln Asp Tyr Asp Ile Arg Asp Cys
            740                 745                 750

Ala Ala Val Lys Val Phe His Arg Pro Trp Arg Arg Gly Trp His Phe
        755                 760                 765

Tyr Asp Asp Arg Glu Phe Ile Tyr Leu Arg Pro Phe Ala Cys Asp Thr
    770                 775                 780

Lys Leu Glu Trp Val Cys Gln Ile Pro Lys Gly Arg Thr Pro Lys Thr
785                 790                 795                 800

Pro Asp Trp Tyr Asn Pro Asp Arg Ala Gly Ile His Gly Pro Pro Leu
                805                 810                 815

Ile Ile Glu Gly Ser Glu Tyr Trp Phe Val Ala Asp Leu His Leu Asn
            820                 825                 830

Tyr Glu Glu Ala Val Leu Tyr Cys Ala Ser Asn His Ser Phe Leu Ala
        835                 840                 845

Thr Ile Thr Ser Phe Val Gly Leu Lys Ala Ile Lys Asn Lys Ile Ala
    850                 855                 860

Asn Ile Ser Gly Asp Gly Gln Lys Trp Trp Ile Arg Ile Ser Glu Trp
865                 870                 875                 880

Pro Ile Asp Asp His Phe Thr Tyr Ser Arg Tyr Pro Trp His Arg Phe
                885                 890                 895

Pro Val Thr Phe Gly Glu Glu Cys Leu Tyr Met Ser Ala Lys Thr Trp
            900                 905                 910

Leu Ile Asp Leu Gly Lys Pro Thr Asp Cys Ser Thr Lys Leu Pro Phe
```

915 920 925

Ile Cys Glu Lys Tyr Asn Val Ser Ser Leu Glu Lys Tyr Ser Pro Asp
930 935 940

Ser Ala Ala Lys Val Gln Cys Ser Glu Gln Trp Ile Pro Phe Gln Asn
945 950 955 960

Lys Cys Phe Leu Lys Ile Lys Pro Val Ser Leu Thr Phe Ser Gln Ala
965 970 975

Ser Asp Thr Cys His Ser Tyr Gly Gly Thr Leu Pro Ser Val Leu Ser
980 985 990

Gln Ile Glu Gln Asp Phe Ile Thr Ser Leu Leu Pro Asp Met Glu Ala
995 1000 1005

Thr Leu Trp Ile Gly Leu Arg Trp Thr Ala Tyr Glu Lys Ile Asn
1010 1015 1020

Lys Trp Thr Asp Asn Arg Glu Leu Thr Tyr Ser Asn Phe His Pro
1025 1030 1035

Leu Leu Val Ser Gly Arg Leu Arg Ile Pro Glu Asn Phe Phe Glu
1040 1045 1050

Glu Glu Ser Arg Tyr His Cys Ala Leu Ile Leu Asn Leu Gln Lys
1055 1060 1065

Ser Pro Phe Thr Gly Thr Trp Asn Phe Thr Ser Cys Ser Glu Arg
1070 1075 1080

His Phe Val Ser Leu Cys Gln Lys Tyr Ser Glu Val Lys Ser Arg
1085 1090 1095

Gln Thr Leu Gln Asn Ala Ser Glu Thr Val Lys Tyr Leu Asn Asn
1100 1105 1110

Leu Tyr Lys Ile Ile Pro Lys Thr Leu Thr Trp His Ser Ala Lys
1115 1120 1125

Arg Glu Cys Leu Lys Ser Asn Met Gln Leu Val Ser Ile Thr Asp
1130 1135 1140

Pro Tyr Gln Gln Ala Phe Leu Ser Val Gln Ala Leu Leu His Asn
1145 1150 1155

Ser Ser Leu Trp Ile Gly Leu Phe Ser Gln Asp Asp Glu Leu Asn
1160 1165 1170

Phe Gly Trp Ser Asp Gly Lys Arg Leu His Phe Ser Arg Trp Ala
1175 1180 1185

Glu Thr Asn Gly Gln Leu Glu Asp Cys Val Val Leu Asp Thr Asp
1190 1195 1200

Gly Phe Trp Lys Thr Val Asp Cys Asn Asp Asn Gln Pro Gly Ala
1205 1210 1215

Ile Cys Tyr Tyr Ser Gly Asn Glu Thr Glu Lys Glu Val Lys Pro
1220 1225 1230

Val Asp Ser Val Lys Cys Pro Ser Pro Val Leu Asn Thr Pro Trp
1235 1240 1245

Ile Pro Phe Gln Asn Cys Cys Tyr Asn Phe Ile Ile Thr Lys Asn
1250 1255 1260

Arg His Met Ala Thr Thr Gln Asp Glu Val His Thr Lys Cys Gln
1265 1270 1275

Lys Leu Asn Pro Lys Ser His Ile Leu Ser Ile Arg Asp Glu Lys
1280 1285 1290

Glu Asn Asn Phe Val Leu Glu Gln Leu Leu Tyr Phe Asn Tyr Met
1295 1300 1305

Ala Ser Trp Val Met Leu Gly Ile Thr Tyr Arg Asn Asn Ser Leu
1310 1315 1320

Met Trp Phe Asp Lys Thr Pro Leu Ser Tyr Thr His Trp Arg Ala
1325 1330 1335

Gly Arg Pro Thr Ile Lys Asn Glu Lys Phe Leu Ala Gly Leu Ser
1340 1345 1350

Thr Asp Gly Phe Trp Asp Ile Gln Thr Phe Lys Val Ile Glu Glu
1355 1360 1365

Ala Val Tyr Phe His Gln His Ser Ile Leu Ala Cys Lys Ile Glu
1370 1375 1380

Met Val Asp Tyr Lys Glu Glu His Asn Thr Thr Leu Pro Gln Phe
1385 1390 1395

Met Pro Tyr Glu Asp Gly Ile Tyr Ser Val Ile Gln Lys Lys Val
1400 1405 1410

Thr Trp Tyr Glu Ala Leu Asn Met Cys Ser Gln Ser Gly Gly His
1415 1420 1425

Leu Ala Ser Val His Asn Gln Asn Gly Gln Leu Phe Leu Glu Asp
1430 1435 1440

Ile Val Lys Arg Asp Gly Phe Pro Leu Trp Val Gly Leu Ser Ser
1445 1450 1455

His Asp Gly Ser Glu Ser Ser Phe Glu Trp Ser Asp Gly Ser Thr
1460 1465 1470

Phe Asp Tyr Ile Pro Trp Lys Gly Gln Thr Ser Pro Gly Asn Cys
1475 1480 1485

Val Leu Leu Asp Pro Lys Gly Thr Trp Lys His Glu Lys Cys Asn
1490 1495 1500

Ser Val Lys Asp Gly Ala Ile Cys Tyr Lys Pro Thr Lys Ser Lys
1505 1510 1515

Lys Leu Ser Arg Leu Thr Tyr Ser Ser Arg Cys Pro Ala Ala Lys
1520 1525 1530

Glu Asn Gly Ser Arg Trp Ile Gln Tyr Lys Gly His Cys Tyr Lys
1535 1540 1545

Ser Asp Gln Ala Leu His Ser Phe Ser Glu Ala Lys Lys Leu Cys
1550 1555 1560

Ser Lys His Asp His Ser Ala Thr Ile Val Ser Ile Lys Asp Glu
1565 1570 1575

Asp Glu Asn Lys Phe Val Ser Arg Leu Met Arg Glu Asn Asn Asn
1580 1585 1590

Ile Thr Met Arg Val Trp Leu Gly Leu Ser Gln His Ser Val Asp
1595 1600 1605

```
Gln Ser  Trp Ser Trp Leu Asp  Gly Ser Glu Val Thr  Phe Val Lys
    1610                 1615                 1620

Trp Glu  Asn Lys Ser Lys Ser  Gly Val Gly Arg Cys  Ser Met Leu
    1625                 1630                 1635

Ile Ala  Ser Asn Glu Thr Trp  Lys Lys Val Glu Cys  Glu His Gly
    1640                 1645                 1650

Phe Gly  Arg Val Val Cys Lys  Val Pro Leu Gly Pro  Asp Tyr Thr
    1655                 1660                 1665

Ala Ile  Ala Ile Ile Val Ala  Thr Leu Ser Ile Leu  Val Leu Met
    1670                 1675                 1680

Gly Gly  Leu Ile Trp Phe Leu  Phe Gln Arg His Arg  Leu His Leu
    1685                 1690                 1695

Ala Gly  Phe Ser Ser Val Arg  Tyr Ala Gln Gly Val  Asn Glu Asp
    1700                 1705                 1710

Glu Ile  Met Leu Pro Ser Phe  His Asp
    1715                 1720
```

<210> 86
<211> 61
<212> PRT
<213> Homo sapiens

<400> 86

```
Met Asp Pro Asn Cys Ser Cys Ala Ala Gly Val Ser Cys Thr Cys Ala
1               5                  10                  15

Ser Ser Cys Lys Cys Lys Glu Cys Lys Cys Thr Ser Cys Lys Lys Ser
            20                  25                  30

Cys Cys Ser Cys Cys Pro Val Gly Cys Ala Lys Cys Ala Gln Gly Cys
        35                  40                  45

Ile Cys Lys Gly Ala Ser Glu Lys Cys Ser Cys Cys Ala
    50                  55                  60
```

<210> 87
<211> 300
<212> PRT
<213> Homo sapiens

<400> 87

```
Met Arg Ala Leu Glu Gly Pro Gly Leu Ser Leu Leu Cys Leu Val Leu
1               5                  10                  15

Ala Leu Pro Ala Leu Leu Pro Val Pro Ala Val Arg Gly Val Ala Glu
            20                  25                  30

Thr Pro Thr Tyr Pro Trp Arg Asp Ala Glu Thr Gly Glu Arg Leu Val
        35                  40                  45

Cys Ala Gln Cys Pro Pro Gly Thr Phe Val Gln Arg Pro Cys Arg Arg
    50                  55                  60

Asp Ser Pro Thr Thr Cys Gly Pro Cys Pro Pro Arg His Tyr Thr Gln
65                  70                  75                  80

Phe Trp Asn Tyr Leu Glu Arg Cys Arg Tyr Cys Asn Val Leu Cys Gly
                85                  90                  95

Glu Arg Glu Glu Glu Ala Arg Ala Cys His Ala Thr His Asn Arg Ala
            100                 105                 110

Cys Arg Cys Arg Thr Gly Phe Phe Ala His Ala Gly Phe Cys Leu Glu
        115                 120                 125

His Ala Ser Cys Pro Pro Gly Ala Gly Val Ile Ala Pro Gly Thr Pro
    130                 135                 140

Ser Gln Asn Thr Gln Cys Gln Pro Cys Pro Pro Gly Thr Phe Ser Ala
145                 150                 155                 160

Ser Ser Ser Ser Ser Glu Gln Cys Gln Pro His Arg Asn Cys Thr Ala
                165                 170                 175

Leu Gly Leu Ala Leu Asn Val Pro Gly Ser Ser Ser His Asp Thr Leu
            180                 185                 190

Cys Thr Ser Cys Thr Gly Phe Pro Leu Ser Thr Arg Val Pro Gly Ala
        195                 200                 205

Glu Glu Cys Glu Arg Ala Val Ile Asp Phe Val Ala Phe Gln Asp Ile
    210                 215                 220

Ser Ile Lys Arg Leu Gln Arg Leu Leu Gln Ala Leu Glu Ala Pro Glu
225                 230                 235                 240
```

```
Gly Trp Gly Pro Thr Pro Arg Ala Gly Arg Ala Ala Leu Gln Leu Lys
                245                 250                 255

Leu Arg Arg Arg Leu Thr Glu Leu Leu Gly Ala Gln Asp Gly Ala Leu
            260                 265                 270

Leu Val Arg Leu Leu Gln Ala Leu Arg Val Ala Arg Met Pro Gly Leu
        275                 280                 285

Glu Arg Ser Val Arg Glu Arg Phe Leu Pro Val His
    290                 295                 300
```

<210> 88
<211> 878
<212> PRT
<213> Homo sapiens

<400> 88

```
Thr Ile Tyr Ser Thr Val Ser Ser Ser Thr Thr Ala Ile Thr Ser Pro
1               5                   10                  15

Phe Thr Thr Ala Glu Thr Gly Val Thr Ser Thr Pro Ser Ser Pro Ser
            20                  25                  30

Ser Leu Ser Thr Asp Ile Pro Thr Thr Ser Leu Arg Thr Leu Thr Pro
        35                  40                  45

Leu Ser Leu Ser Thr Ser Thr Ser Leu Thr Thr Thr Thr Asp Leu Pro
    50                  55                  60

Ser Ile Pro Thr Asp Ile Ser Ser Leu Pro Thr Pro Ile His Ile Ile
65                  70                  75                  80

Ser Ser Ser Pro Ser Ile Gln Ser Thr Glu Thr Ser Ser Leu Val Gly
                85                  90                  95

Thr Thr Ser Pro Thr Met Ser Thr Val Arg Ala Thr Leu Arg Ser Thr
            100                 105                 110

Glu Asn Thr Pro Ile Ser Ser Phe Ser Thr Ser Ile Val Val Thr Pro
        115                 120                 125

Glu Thr Pro Thr Thr Gln Ala Pro Pro Val Leu Met Ser Ala Thr Gly
    130                 135                 140

Thr Gln Thr Ser Pro Val Pro Thr Thr Val Thr Phe Gly Ser Met Asp
145                 150                 155                 160
```

```
Ser Ser Thr Ser Thr Leu His Thr Leu Thr Pro Ser Thr Ala Leu Ser
                165                 170                 175

Lys Ile Met Ser Thr Ser Gln Phe Pro Ile Pro Ser Thr His Ser Ser
            180                 185                 190

Thr Leu Gln Thr Thr Pro Ser Ile Pro Ser Leu Gln Thr Ser Leu Thr
        195                 200                 205

Ser Thr Ser Glu Phe Thr Thr Glu Ser Phe Thr Arg Gly Ser Thr Ser
    210                 215                 220

Thr Asn Ala Ile Leu Thr Ser Phe Ser Thr Ile Ile Trp Ser Ser Thr
225                 230                 235                 240

Pro Thr Ile Ile Met Ser Ser Ser Pro Ser Ser Ala Ser Ile Thr Pro
                245                 250                 255

Val Phe Ala Thr Thr Ile His Ser Val Pro Ser Ser Pro Tyr Ile Phe
            260                 265                 270

Ser Thr Glu Asn Val Gly Ser Ala Ser Ile Thr Ala Phe Pro Ser Leu
        275                 280                 285

Ser Ser Ser Ser Thr Thr Ser Thr Ser Pro Thr Ser Ser Ser Leu Thr
    290                 295                 300

Thr Ala Leu Thr Glu Ile Thr Pro Phe Ser Tyr Ile Ser Leu Pro Ser
305                 310                 315                 320

Thr Thr Pro Cys Pro Gly Thr Ile Thr Ile Thr Ile Val Pro Ala Ser
                325                 330                 335

Pro Thr Asp Pro Cys Val Glu Met Asp Pro Ser Thr Glu Ala Thr Ser
            340                 345                 350

Pro Pro Thr Thr Pro Leu Thr Val Phe Pro Phe Thr Thr Glu Met Val
        355                 360                 365

Thr Cys Pro Ser Ser Ile Ser Met Gln Thr Thr Leu Ala Thr His Met
    370                 375                 380

Asp Thr Ser Ser Met Thr Pro Glu Ser Glu Ser Ser Ile Ile Pro Asn
385                 390                 395                 400
```

```
Ala Ser Ser Ser Thr Gly Thr Gly Thr Val Pro Thr Asn Thr Val Phe
                405                 410                 415

Thr Ser Thr Arg Leu Pro Thr Ser Glu Thr Trp Leu Ser Asn Asn Ser
            420                 425                 430

Val Ile Pro Thr Pro Leu Pro Gly Val Ser Thr Ile Pro Leu Thr Met
        435                 440                 445

Lys Pro Ser Ser Ser Leu Pro Thr Ile Leu Arg Thr Ser Ser Lys Ser
    450                 455                 460

Thr His Pro Ser Pro Pro Thr Ala Arg Thr Ser Glu Thr Ser Val Ala
465                 470                 475                 480

Thr Thr Gln Thr Pro Thr Thr Leu Thr Thr Arg Arg Thr Thr Pro Ile
                485                 490                 495

Thr Ser Trp Met Thr Thr Gln Ser Thr Leu Thr Thr Thr Ala Gly Thr
            500                 505                 510

Cys Asp Asn Gly Gly Thr Trp Glu Gln Gly Gln Cys Ala Cys Leu Pro
        515                 520                 525

Gly Phe Ser Gly Asp Arg Cys Gln Leu Gln Thr Arg Cys Gln Asn Gly
    530                 535                 540

Gly Gln Trp Asp Gly Leu Lys Cys Gln Cys Pro Ser Thr Phe Tyr Gly
545                 550                 555                 560

Ser Ser Cys Glu Phe Ala Val Glu Gln Val Asp Leu Asp Val Val Glu
                565                 570                 575

Thr Glu Val Gly Met Glu Val Ser Val Asp Gln Gln Phe Ser Pro Asp
            580                 585                 590

Leu Asn Asp Asn Thr Ser Gln Ala Tyr Arg Asp Phe Asn Lys Thr Phe
        595                 600                 605

Trp Asn Gln Met Gln Lys Ile Phe Ala Asp Met Gln Gly Phe Thr Phe
    610                 615                 620

Lys Gly Val Glu Ile Leu Ser Leu Arg Asn Gly Ser Ile Val Val Asp
625                 630                 635                 640
```

Tyr Leu Val Leu Leu Glu Met Pro Phe Ser Pro Gln Leu Glu Ser Glu
645 650 655

Tyr Glu Gln Val Lys Thr Thr Leu Lys Glu Gly Leu Gln Asn Ala Ser
660 665 670

Gln Asp Ala Asn Ser Cys Gln Asp Ser Gln Thr Leu Cys Phe Lys Pro
675 680 685

Asp Ser Ile Lys Val Asn Asn Asn Ser Lys Thr Glu Leu Thr Pro Glu
690 695 700

Ala Ile Cys Arg Arg Ala Ala Pro Thr Gly Tyr Glu Glu Phe Tyr Phe
705 710 715 720

Pro Leu Val Glu Ala Thr Arg Leu Arg Cys Val Thr Lys Cys Thr Ser
725 730 735

Gly Val Asp Asn Ala Ile Asp Cys His Gln Gly Gln Cys Val Leu Glu
740 745 750

Thr Ser Gly Pro Ala Cys Arg Cys Tyr Ser Thr Asp Thr His Trp Phe
755 760 765

Ser Gly Pro Arg Cys Glu Val Ala Val His Trp Arg Ala Leu Val Gly
770 775 780

Gly Leu Thr Ala Gly Ala Ala Leu Leu Val Leu Leu Leu Leu Ala Leu
785 790 795 800

Gly Val Arg Ala Val Arg Ser Gly Trp Trp Gly Gly Gln Arg Arg Gly
805 810 815

Arg Ser Trp Asp Gln Asp Arg Lys Trp Phe Glu Thr Trp Asp Glu Glu
820 825 830

Val Val Gly Thr Phe Ser Asn Trp Gly Phe Glu Asp Asp Gly Thr Asp
835 840 845

Lys Asp Thr Asn Phe His Val Ala Leu Glu Asn Val Asp Thr Thr Met
850 855 860

Lys Val His Ile Lys Arg Pro Glu Met Thr Ser Ser Ser Val
865 870 875

<210> 89

<211> 61
<212> PRT
<213> Homo sapiens

<400> 89

Met Asp Pro Asn Cys Ser Cys Ser Pro Val Gly Ser Cys Ala Cys Ala
1 5 10 15

Gly Ser Cys Lys Cys Lys Glu Cys Lys Cys Thr Ser Cys Lys Lys Ser
20 25 30

Cys Cys Ser Cys Cys Pro Val Gly Cys Ala Lys Cys Ala Gln Gly Cys
35 40 45

Ile Cys Lys Gly Thr Ser Asp Lys Cys Ser Cys Cys Ala
50 55 60

<210> 90
<211> 106
<212> PRT
<213> Homo sapiens

<400> 90

Met Ala His Ala Thr Leu Ser Ala Ala Pro Ser Asn Pro Arg Leu Leu
1 5 10 15

Arg Val Ala Leu Leu Leu Leu Leu Leu Val Gly Ser Arg Arg Ala Ala
20 25 30

Gly Ala Ser Val Val Thr Glu Leu Arg Cys Gln Cys Leu Gln Thr Leu
35 40 45

Gln Gly Ile His Leu Lys Asn Ile Gln Ser Val Asn Val Arg Ser Pro
50 55 60

Gly Pro His Cys Ala Gln Thr Glu Val Ile Ala Thr Leu Lys Asn Gly
65 70 75 80

Lys Lys Ala Cys Leu Asn Pro Ala Ser Pro Met Val Gln Lys Ile Ile
85 90 95

Glu Lys Ile Leu Asn Lys Gly Ser Thr Asn
100 105

<210> 91
<211> 683
<212> PRT
<213> Homo sapiens

<400> 91

```
Met Ala Leu Phe Val Arg Leu Leu Ala Leu Ala Leu Ala Leu Ala Leu
1               5                  10                  15

Gly Pro Ala Ala Thr Leu Ala Gly Pro Ala Lys Ser Pro Tyr Gln Leu
            20                  25                  30

Val Leu Gln His Ser Arg Leu Arg Gly Arg Gln His Gly Pro Asn Val
        35                  40                  45

Cys Ala Val Gln Lys Val Ile Gly Thr Asn Arg Lys Tyr Phe Thr Asn
    50                  55                  60

Cys Lys Gln Trp Tyr Gln Arg Lys Ile Cys Gly Lys Ser Thr Val Ile
65                  70                  75                  80

Ser Tyr Glu Cys Cys Pro Gly Tyr Glu Lys Val Pro Gly Glu Lys Gly
                85                  90                  95

Cys Pro Ala Ala Leu Pro Leu Ser Asn Leu Tyr Glu Thr Leu Gly Val
            100                 105                 110

Val Gly Ser Thr Thr Thr Gln Leu Tyr Thr Asp Arg Thr Glu Lys Leu
        115                 120                 125

Arg Pro Glu Met Glu Gly Pro Gly Ser Phe Thr Ile Phe Ala Pro Ser
    130                 135                 140

Asn Glu Ala Trp Ala Ser Leu Pro Ala Glu Val Leu Asp Ser Leu Val
145                 150                 155                 160

Ser Asn Val Asn Ile Glu Leu Leu Asn Ala Leu Arg Tyr His Met Val
                165                 170                 175

Gly Arg Arg Val Leu Thr Asp Glu Leu Lys His Gly Met Thr Leu Thr
            180                 185                 190

Ser Met Tyr Gln Asn Ser Asn Ile Gln Ile His His Tyr Pro Asn Gly
        195                 200                 205

Ile Val Thr Val Asn Cys Ala Arg Leu Leu Lys Ala Asp His His Ala
    210                 215                 220

Thr Asn Gly Val Val His Leu Ile Asp Lys Val Ile Ser Thr Ile Thr
225                 230                 235                 240
```

```
Asn Asn Ile Gln Gln Ile Ile Glu Ile Glu Asp Thr Phe Glu Thr Leu
                245                 250                 255

Arg Ala Ala Val Ala Ala Ser Gly Leu Asn Thr Met Leu Glu Gly Asn
            260                 265                 270

Gly Gln Tyr Thr Leu Leu Ala Pro Thr Asn Glu Ala Phe Glu Lys Ile
        275                 280                 285

Pro Ser Glu Thr Leu Asn Arg Ile Leu Gly Asp Pro Glu Ala Leu Arg
    290                 295                 300

Asp Leu Leu Asn Asn His Ile Leu Lys Ser Ala Met Cys Ala Glu Ala
305                 310                 315                 320

Ile Val Ala Gly Leu Ser Val Glu Thr Leu Glu Gly Thr Thr Leu Glu
                325                 330                 335

Val Gly Cys Ser Gly Asp Met Leu Thr Ile Asn Gly Lys Ala Ile Ile
            340                 345                 350

Ser Asn Lys Asp Ile Leu Ala Thr Asn Gly Val Ile His Tyr Ile Asp
        355                 360                 365

Glu Leu Leu Ile Pro Asp Ser Ala Lys Thr Leu Phe Glu Leu Ala Ala
    370                 375                 380

Glu Ser Asp Val Ser Thr Ala Ile Asp Leu Phe Arg Gln Ala Gly Leu
385                 390                 395                 400

Gly Asn His Leu Ser Gly Ser Glu Arg Leu Thr Leu Leu Ala Pro Leu
                405                 410                 415

Asn Ser Val Phe Lys Asp Gly Thr Pro Pro Ile Asp Ala His Thr Arg
            420                 425                 430

Asn Leu Leu Arg Asn His Ile Ile Lys Asp Gln Leu Ala Ser Lys Tyr
        435                 440                 445

Leu Tyr His Gly Gln Thr Leu Glu Thr Leu Gly Gly Lys Lys Leu Arg
    450                 455                 460

Val Phe Val Tyr Arg Asn Ser Leu Cys Ile Glu Asn Ser Cys Ile Ala
465                 470                 475                 480
```

```
Ala His Asp Lys Arg Gly Arg Tyr Gly Thr Leu Phe Thr Met Asp Arg
                485                 490                 495

Val Leu Thr Pro Pro Met Gly Thr Val Met Asp Val Leu Lys Gly Asp
            500                 505                 510

Asn Arg Phe Ser Met Leu Val Ala Ala Ile Gln Ser Ala Gly Leu Thr
        515                 520                 525

Glu Thr Leu Asn Arg Glu Gly Val Tyr Thr Val Phe Ala Pro Thr Asn
    530                 535                 540

Glu Ala Phe Arg Ala Leu Pro Pro Arg Glu Arg Ser Arg Leu Leu Gly
545                 550                 555                 560

Asp Ala Lys Glu Leu Ala Asn Ile Leu Lys Tyr His Ile Gly Asp Glu
                565                 570                 575

Ile Leu Val Ser Gly Gly Ile Gly Ala Leu Val Arg Leu Lys Ser Leu
            580                 585                 590

Gln Gly Asp Lys Leu Glu Val Ser Leu Lys Asn Asn Val Val Ser Val
        595                 600                 605

Asn Lys Glu Pro Val Ala Glu Pro Asp Ile Met Ala Thr Asn Gly Val
    610                 615                 620

Val His Val Ile Thr Asn Val Leu Gln Pro Pro Ala Asn Arg Pro Gln
625                 630                 635                 640

Glu Arg Gly Asp Glu Leu Ala Asp Ser Ala Leu Glu Ile Phe Lys Gln
                645                 650                 655

Ala Ser Ala Phe Ser Arg Ala Ser Gln Arg Ser Val Arg Leu Ala Pro
            660                 665                 670

Val Tyr Gln Lys Leu Leu Glu Arg Met Lys His
        675                 680
```

<210> 92
<211> 431
<212> PRT
<213> Homo sapiens

<400> 92

```
Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala
```

```
1               5                   10                  15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser
            20                  25                  30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser
        35                  40                  45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu     50
55                  60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro
65                  70                  75                  80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly
                85                  90                  95

Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser
            100                 105                 110

Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr
        115                 120                 125

Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys
    130                 135                 140

Glu Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu
145                 150                 155                 160

Ser Lys Ile Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile
                165                 170                 175

Tyr Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile
            180                 185                 190

Ser Val Tyr Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu
        195                 200                 205

Phe Leu Leu Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu
    210                 215                 220

Val Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg
225                 230                 235                 240

His Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser
                245                 250                 255
```

```
Ile Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn
            260                 265                 270

Lys Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe
        275                 280                 285

Arg Ser Ile Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser
    290                 295                 300

Lys Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu
305                 310                 315                 320

Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr
                325                 330                 335

Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu
            340                 345                 350

Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn
        355                 360                 365

Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His
    370                 375                 380

Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln
385                 390                 395                 400

Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile
                405                 410                 415

Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            420                 425                 430
```

<210> 93
<211> 324
<212> PRT
<213> Homo sapiens

<400> 93

```
Met Phe Cys Gly Asp Tyr Val Gln Gly Thr Ile Phe Pro Ala Pro Asn
1               5                   10                  15

Phe Asn Pro Ile Met Asp Ala Gln Met Leu Gly Gly Ala Leu Gln Gly
            20                  25                  30
```

```
Phe Asp Cys Asp Lys Asp Met Leu Ile Asn Ile Leu Thr Gln Arg Cys
        35                  40                  45

Asn Ala Gln Arg Met Met Ile Ala Glu Ala Tyr Gln Ser Met Tyr Gly
    50                  55                  60

Arg Asp Leu Ile Gly Asp Met Lys Gly Ala Ala Phe Gly Ser Leu Pro
65                  70                  75                  80

Arg Cys Asp Gly Trp Leu Met Tyr Pro Pro Pro Leu Tyr Asp Ala His
                85                  90                  95

Glu Leu Trp His Ala Met Lys Gly Val Gly Thr Asp Glu Asn Cys Leu
            100                 105                 110

Ile Glu Ile Leu Ala Ser Arg Thr Asn Gly Glu Ile Phe Gln Met Arg
        115                 120                 125

Glu Ala Tyr Cys Leu Gln Tyr Ser Asn Asn Leu Gln Glu Asp Ile Tyr
    130                 135                 140

Ser Glu Thr Ser Gly His Phe Arg Asp Thr Leu Met Asn Leu Val Gln
145                 150                 155                 160

Gly Thr Arg Glu Glu Gly Tyr Thr Asp Pro Ala Met Ala Ala Gln Asp
                165                 170                 175

Ala Met Val Leu Trp Glu Ala Cys Gln Gln Lys Thr Gly Glu His Lys
            180                 185                 190

Thr Met Leu Gln Met Ile Leu Cys Asn Lys Ser Tyr Gln Gln Leu Arg
        195                 200                 205

Leu Val Phe Gln Glu Phe Gln Asn Ile Ser Gly Gln Asp Met Val Asp
    210                 215                 220

Ala Ile Asn Glu Cys Tyr Asp Gly Tyr Phe Gln Glu Leu Leu Val Ala
225                 230                 235                 240

Ile Val Leu Cys Val Arg Asp Lys Pro Ala Tyr Phe Ala Tyr Arg Leu
                245                 250                 255

Tyr Ser Ala Ile His Asp Phe Gly Phe His Asn Lys Thr Val Ile Arg
            260                 265                 270

Ile Leu Ile Ala Arg Ser Glu Ile Asp Leu Leu Thr Ile Arg Lys Arg
```

275 280 285

Tyr Lys Glu Arg Tyr Gly Lys Ser Leu Phe His Asp Ile Arg Asn Phe
290 295 300

Ala Ser Gly His Tyr Lys Lys Ala Leu Leu Ala Ile Cys Ala Gly Asp
305 310 315 320

Ala Glu Asp Tyr

<210> 94
<211> 61
<212> PRT
<213> Homo sapiens

<400> 94

Met Asp Pro Asn Cys Ser Cys Ala Ala Gly Val Ser Cys Thr Cys Ala
1 5 10 15

Gly Ser Cys Lys Cys Lys Glu Cys Lys Cys Thr Ser Cys Lys Lys Ser
20 25 30

Cys Cys Ser Cys Cys Pro Val Gly Cys Ser Lys Cys Ala Gln Gly Cys
35 40 45

Val Cys Lys Gly Ala Ser Glu Lys Cys Ser Cys Cys Asp
50 55 60

<210> 95
<211> 346
<212> PRT
<213> Homo sapiens

<400> 95

Met Ala Met Val Ser Glu Phe Leu Lys Gln Ala Trp Phe Ile Glu Asn
1 5 10 15

Glu Glu Gln Glu Tyr Val Gln Thr Val Lys Ser Ser Lys Gly Gly Pro
20 25 30

Gly Ser Ala Val Ser Pro Tyr Pro Thr Phe Asn Pro Ser Ser Asp Val
35 40 45

Ala Ala Leu His Lys Ala Ile Met Val Lys Gly Val Asp Glu Ala Thr
50 55 60

```
Ile Ile Asp Ile Leu Thr Lys Arg Asn Asn Ala Gln Arg Gln Gln Ile
65                  70                  75                  80

Lys Ala Ala Tyr Leu Gln Glu Thr Gly Lys Pro Leu Asp Glu Thr Leu
                85                  90                  95

Lys Lys Ala Leu Thr Gly His Leu Glu Glu Val Val Leu Ala Leu Leu
            100                 105                 110

Lys Thr Pro Ala Gln Phe Asp Ala Asp Glu Leu Arg Ala Ala Met Lys
        115                 120                 125

Gly Leu Gly Thr Asp Glu Asp Thr Leu Ile Glu Ile Leu Ala Ser Arg
    130                 135                 140

Thr Asn Lys Glu Ile Arg Asp Ile Asn Arg Val Tyr Arg Glu Glu Leu
145                 150                 155                 160

Lys Arg Asp Leu Ala Lys Asp Ile Thr Ser Asp Thr Ser Gly Asp Phe
                165                 170                 175

Arg Asn Ala Leu Leu Ser Leu Ala Lys Gly Asp Arg Ser Glu Asp Phe
            180                 185                 190

Gly Val Asn Glu Asp Leu Ala Asp Ser Asp Ala Arg Ala Leu Tyr Glu
        195                 200                 205

Ala Gly Glu Arg Arg Lys Gly Thr Asp Val Asn Val Phe Asn Thr Ile
    210                 215                 220

Leu Thr Thr Arg Ser Tyr Pro Gln Leu Arg Arg Val Phe Gln Lys Tyr
225                 230                 235                 240

Thr Lys Tyr Ser Lys His Asp Met Asn Lys Val Leu Asp Leu Glu Leu
                245                 250                 255

Lys Gly Asp Ile Glu Lys Cys Leu Thr Ala Ile Val Lys Cys Ala Thr
            260                 265                 270

Ser Lys Pro Ala Phe Phe Ala Glu Lys Leu His Gln Ala Met Lys Gly
        275                 280                 285

Val Gly Thr Arg His Lys Ala Leu Ile Arg Ile Met Val Ser Arg Ser
    290                 295                 300

Glu Ile Asp Met Asn Asp Ile Lys Ala Phe Tyr Gln Lys Met Tyr Gly
305                 310                 315                 320
```

```
Ile Ser Leu Cys Gln Ala Ile Leu Asp Glu Thr Lys Gly Asp Tyr Glu
                325                 330                 335

Lys Ile Leu Val Ala Leu Cys Gly Gly Asn
            340                 345
```

<210> 96
<211> 132
<212> PRT
<213> Homo sapiens

<400> 96

```
Met Lys Ser Ser Gly Leu Phe Pro Phe Leu Val Leu Leu Ala Leu Gly
1               5                   10                  15

Thr Leu Ala Pro Trp Ala Val Glu Gly Ser Gly Lys Ser Phe Lys Ala
            20                  25                  30

Gly Val Cys Pro Pro Lys Lys Ser Ala Gln Cys Leu Arg Tyr Lys Lys
        35                  40                  45

Pro Glu Cys Gln Ser Asp Trp Gln Cys Pro Gly Lys Lys Arg Cys Cys
    50                  55                  60

Pro Asp Thr Cys Gly Ile Lys Cys Leu Asp Pro Val Asp Thr Pro Asn
65                  70                  75                  80

Pro Thr Arg Arg Lys Pro Gly Lys Cys Pro Val Thr Tyr Gly Gln Cys
                85                  90                  95

Leu Met Leu Asn Pro Pro Asn Phe Cys Glu Met Asp Gly Gln Cys Lys
            100                 105                 110

Arg Asp Leu Lys Cys Cys Met Gly Met Cys Gly Lys Ser Cys Val Ser
        115                 120                 125

Pro Val Lys Ala
    130
```

<210> 97
<211> 764
<212> PRT
<213> Homo sapiens

<400> 97

```
Met Leu Leu Phe Val Leu Thr Cys Leu Leu Ala Val Phe Pro Ala Ile
```

1 5 10 15

Ser Thr Lys Ser Pro Ile Phe Gly Pro Glu Glu Val Asn Ser Val Glu
20 25 30

Gly Asn Ser Val Ser Ile Thr Cys Tyr Tyr Pro Pro Thr Ser Val Asn
35 40 45

Arg His Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala Arg Gly Gly Cys
50 55 60

Ile Thr Leu Ile Ser Ser Glu Gly Tyr Val Ser Ser Lys Tyr Ala Gly
65 70 75 80

Arg Ala Asn Leu Thr Asn Phe Pro Glu Asn Gly Thr Phe Val Val Asn
85 90 95

Ile Ala Gln Leu Ser Gln Asp Asp Ser Gly Arg Tyr Lys Cys Gly Leu
100 105 110

Gly Ile Asn Ser Arg Gly Leu Ser Phe Asp Val Ser Leu Glu Val Ser
115 120 125

Gln Gly Pro Gly Leu Leu Asn Asp Thr Lys Val Tyr Thr Val Asp Leu
130 135 140

Gly Arg Thr Val Thr Ile Asn Cys Pro Phe Lys Thr Glu Asn Ala Gln
145 150 155 160

Lys Arg Lys Ser Leu Tyr Lys Gln Ile Gly Leu Tyr Pro Val Leu Val
165 170 175

Ile Asp Ser Ser Gly Tyr Val Asn Pro Asn Tyr Thr Gly Arg Ile Arg
180 185 190

Leu Asp Ile Gln Gly Thr Gly Gln Leu Leu Phe Ser Val Val Ile Asn
195 200 205

Gln Leu Arg Leu Ser Asp Ala Gly Gln Tyr Leu Cys Gln Ala Gly Asp
210 215 220

Asp Ser Asn Ser Asn Lys Lys Asn Ala Asp Leu Gln Val Leu Lys Pro
225 230 235 240

Glu Pro Glu Leu Val Tyr Glu Asp Leu Arg Gly Ser Val Thr Phe His
245 250 255

```
Cys Ala Leu Gly Pro Glu Val Ala Asn Val Ala Lys Phe Leu Cys Arg
            260                 265                 270

Gln Ser Ser Gly Glu Asn Cys Asp Val Val Val Asn Thr Leu Gly Lys
        275                 280                 285

Arg Ala Pro Ala Phe Glu Gly Arg Ile Leu Leu Asn Pro Gln Asp Lys
    290                 295                 300

Asp Gly Ser Phe Ser Val Val Ile Thr Gly Leu Arg Lys Glu Asp Ala
305                 310                 315                 320

Gly Arg Tyr Leu Cys Gly Ala His Ser Asp Gly Gln Leu Gln Glu Gly
                325                 330                 335

Ser Pro Ile Gln Ala Trp Gln Leu Phe Val Asn Glu Glu Ser Thr Ile
            340                 345                 350

Pro Arg Ser Pro Thr Val Val Lys Gly Val Ala Gly Gly Ser Val Ala
        355                 360                 365

Val Leu Cys Pro Tyr Asn Arg Lys Glu Ser Lys Ser Ile Lys Tyr Trp
    370                 375                 380

Cys Leu Trp Glu Gly Ala Gln Asn Gly Arg Cys Pro Leu Leu Val Asp
385                 390                 395                 400

Ser Glu Gly Trp Val Lys Ala Gln Tyr Glu Gly Arg Leu Ser Leu Leu
                405                 410                 415

Glu Glu Pro Gly Asn Gly Thr Phe Thr Val Ile Leu Asn Gln Leu Thr
            420                 425                 430

Ser Arg Asp Ala Gly Phe Tyr Trp Cys Leu Thr Asn Gly Asp Thr Leu
        435                 440                 445

Trp Arg Thr Thr Val Glu Ile Lys Ile Ile Glu Gly Glu Pro Asn Leu
    450                 455                 460

Lys Val Pro Gly Asn Val Thr Ala Val Leu Gly Glu Thr Leu Lys Val
465                 470                 475                 480

Pro Cys His Phe Pro Cys Lys Phe Ser Ser Tyr Glu Lys Tyr Trp Cys
                485                 490                 495
```

```
Lys Trp Asn Asn Thr Gly Cys Gln Ala Leu Pro Ser Gln Asp Glu Gly
            500                 505                 510

Pro Ser Lys Ala Phe Val Asn Cys Asp Glu Asn Ser Arg Leu Val Ser
        515                 520                 525

Leu Thr Leu Asn Leu Val Thr Arg Ala Asp Glu Gly Trp Tyr Trp Cys
    530                 535                 540

Gly Val Lys Gln Gly His Phe Tyr Gly Glu Thr Ala Ala Val Tyr Val
545                 550                 555                 560

Ala Val Glu Glu Arg Lys Ala Ala Gly Ser Arg Asp Val Ser Leu Ala
                565                 570                 575

Lys Ala Asp Ala Ala Pro Asp Glu Lys Val Leu Asp Ser Gly Phe Arg
            580                 585                 590

Glu Ile Glu Asn Lys Ala Ile Gln Asp Pro Arg Leu Phe Ala Glu Glu
        595                 600                 605

Lys Ala Val Ala Asp Thr Arg Asp Gln Ala Asp Gly Ser Arg Ala Ser
    610                 615                 620

Val Asp Ser Gly Ser Ser Glu Glu Gln Gly Gly Ser Ser Arg Ala Leu
625                 630                 635                 640

Val Ser Thr Leu Val Pro Leu Gly Leu Val Leu Ala Val Gly Ala Val
                645                 650                 655

Ala Val Gly Val Ala Arg Ala Arg His Arg Lys Asn Val Asp Arg Val
            660                 665                 670

Ser Ile Arg Ser Tyr Arg Thr Asp Ile Ser Met Ser Asp Phe Glu Asn
        675                 680                 685

Ser Arg Glu Phe Gly Ala Asn Asp Asn Met Gly Ala Ser Ser Ile Thr
    690                 695                 700

Gln Glu Thr Ser Leu Gly Gly Lys Glu Glu Phe Val Ala Thr Thr Glu
705                 710                 715                 720

Ser Thr Thr Glu Thr Lys Glu Pro Lys Lys Ala Lys Arg Ser Ser Lys
                725                 730                 735

Glu Glu Ala Glu Met Ala Tyr Lys Asp Phe Leu Leu Gln Ser Ser Thr
            740                 745                 750
```

Val Ala Ala Glu Ala Gln Asp Gly Pro Gln Glu Ala
755 760

<210> 98
<211> 702
<212> PRT
<213> Homo sapiens

<400> 98

Met Glu Ser Pro Ser Ala Pro Pro His Arg Trp Cys Ile Pro Trp Gln
1 5 10 15

Arg Leu Leu Leu Thr Ala Ser Leu Leu Thr Phe Trp Asn Pro Pro Thr
20 25 30

Thr Ala Lys Leu Thr Ile Glu Ser Thr Pro Phe Asn Val Ala Glu Gly
35 40 45

Lys Glu Val Leu Leu Leu Val His Asn Leu Pro Gln His Leu Phe Gly
50 55 60

Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly Asn Arg Gln Ile Ile
65 70 75 80

Gly Tyr Val Ile Gly Thr Gln Gln Ala Thr Pro Gly Pro Ala Tyr Ser
85 90 95

Gly Arg Glu Ile Ile Tyr Pro Asn Ala Ser Leu Leu Ile Gln Asn Ile
100 105 110

Ile Gln Asn Asp Thr Gly Phe Tyr Thr Leu His Val Ile Lys Ser Asp
115 120 125

Leu Val Asn Glu Glu Ala Thr Gly Gln Phe Arg Val Tyr Pro Glu Leu
130 135 140

Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Lys Pro Val Glu Asp Lys
145 150 155 160

Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Thr Gln Asp Ala Thr Tyr
165 170 175

Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu Gln
180 185 190

```
Leu Ser Asn Gly Asn Arg Thr Leu Thr Leu Phe Asn Val Thr Arg Asn
        195                 200                 205

Asp Thr Ala Ser Tyr Lys Cys Glu Thr Gln Asn Pro Val Ser Ala Arg
    210                 215                 220

Arg Ser Asp Ser Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Ala Pro
225                 230                 235                 240

Thr Ile Ser Pro Leu Asn Thr Ser Tyr Arg Ser Gly Glu Asn Leu Asn
                245                 250                 255

Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser Trp Phe
            260                 265                 270

Val Asn Gly Thr Phe Gln Gln Ser Thr Gln Glu Leu Phe Ile Pro Asn
        275                 280                 285

Ile Thr Val Asn Asn Ser Gly Ser Tyr Thr Cys Gln Ala His Asn Ser
    290                 295                 300

Asp Thr Gly Leu Asn Arg Thr Thr Val Thr Thr Ile Thr Val Tyr Ala
305                 310                 315                 320

Glu Pro Pro Lys Pro Phe Ile Thr Ser Asn Asn Ser Asn Pro Val Glu
                325                 330                 335

Asp Glu Asp Ala Val Ala Leu Thr Cys Glu Pro Glu Ile Gln Asn Thr
            340                 345                 350

Thr Tyr Leu Trp Trp Val Asn Asn Gln Ser Leu Pro Val Ser Pro Arg
        355                 360                 365

Leu Gln Leu Ser Asn Asp Asn Arg Thr Leu Thr Leu Leu Ser Val Thr
    370                 375                 380

Arg Asn Asp Val Gly Pro Tyr Glu Cys Gly Ile Gln Asn Glu Leu Ser
385                 390                 395                 400

Val Asp His Ser Asp Pro Val Ile Leu Asn Val Leu Tyr Gly Pro Asp
                405                 410                 415

Asp Pro Thr Ile Ser Pro Ser Tyr Thr Tyr Tyr Arg Pro Gly Val Asn
            420                 425                 430

Leu Ser Leu Ser Cys His Ala Ala Ser Asn Pro Pro Ala Gln Tyr Ser
```

```
        435                 440                 445

Trp Leu Ile Asp Gly Asn Ile Gln Gln His Thr Gln Glu Leu Phe Ile
    450                 455                 460

Ser Asn Ile Thr Glu Lys Asn Ser Gly Leu Tyr Thr Cys Gln Ala Asn
465                 470                 475                 480

Asn Ser Ala Ser Gly His Ser Arg Thr Thr Val Lys Thr Ile Thr Val
                485                 490                 495

Ser Ala Glu Leu Pro Lys Pro Ser Ile Ser Ser Asn Asn Ser Lys Pro
            500                 505                 510

Val Glu Asp Lys Asp Ala Val Ala Phe Thr Cys Glu Pro Glu Ala Gln
        515                 520                 525

Asn Thr Thr Tyr Leu Trp Trp Val Asn Gly Gln Ser Leu Pro Val Ser
    530                 535                 540

Pro Arg Leu Gln Leu Ser Asn Gly Asn Arg Thr Leu Thr Leu Phe Asn
545                 550                 555                 560

Val Thr Arg Asn Asp Ala Arg Ala Tyr Val Cys Gly Ile Gln Asn Ser
                565                 570                 575

Val Ser Ala Asn Arg Ser Asp Pro Val Thr Leu Asp Val Leu Tyr Gly
            580                 585                 590

Pro Asp Thr Pro Ile Ile Ser Pro Pro Asp Ser Ser Tyr Leu Ser Gly
        595                 600                 605

Ala Asn Leu Asn Leu Ser Cys His Ser Ala Ser Asn Pro Ser Pro Gln
    610                 615                 620

Tyr Ser Trp Arg Ile Asn Gly Ile Pro Gln Gln His Thr Gln Val Leu
625                 630                 635                 640

Phe Ile Ala Lys Ile Thr Pro Asn Asn Asn Gly Thr Tyr Ala Cys Phe
                645                 650                 655

Val Ser Asn Leu Ala Thr Gly Arg Asn Asn Ser Ile Val Lys Ser Ile
            660                 665                 670

Thr Val Ser Ala Ser Gly Thr Ser Pro Gly Leu Ser Ala Gly Ala Thr
        675                 680                 685
```

Val Gly Ile Met Ile Gly Val Leu Val Gly Val Ala Leu Ile
690 695 700

<210> 99
<211> 1015
<212> PRT
<213> Homo sapiens

<400> 99

Met Gly Pro Pro Leu Pro Leu Leu Leu Leu Leu Leu Leu Leu Pro
1 5 10 15

Pro Arg Val Leu Pro Ala Ala Pro Ser Ser Val Pro Arg Gly Arg Gln
20 25 30

Leu Pro Gly Arg Leu Gly Cys Leu Leu Glu Glu Gly Leu Cys Gly Ala
35 40 45

Ser Glu Ala Cys Val Asn Asp Gly Val Phe Gly Arg Cys Gln Lys Val
50 55 60

Pro Ala Met Asp Phe Tyr Arg Tyr Glu Val Ser Pro Val Ala Leu Gln
65 70 75 80

Arg Leu Arg Val Ala Leu Gln Lys Leu Ser Gly Thr Gly Phe Thr Trp
85 90 95

Gln Asp Asp Tyr Thr Gln Tyr Val Met Asp Gln Glu Leu Ala Asp Leu
100 105 110

Pro Lys Thr Tyr Leu Arg Arg Pro Glu Ala Ser Ser Pro Ala Arg Pro
115 120 125

Ser Lys His Ser Val Gly Ser Glu Arg Arg Tyr Ser Arg Glu Gly Gly
130 135 140

Ala Ala Leu Ala Asn Ala Leu Arg Arg His Leu Pro Phe Leu Glu Ala
145 150 155 160

Leu Ser Gln Ala Pro Ala Ser Asp Val Leu Ala Arg Thr His Thr Ala
165 170 175

Gln Asp Arg Pro Pro Ala Glu Gly Asp Asp Arg Phe Ser Glu Ser Ile
180 185 190

```
Leu Thr Tyr Val Ala His Thr Ser Ala Leu Thr Tyr Pro Pro Gly Pro
        195                 200                 205

Arg Thr Gln Leu Arg Glu Asp Leu Leu Pro Arg Thr Leu Gly Gln Leu
    210                 215                 220

Gln Pro Asp Glu Leu Ser Pro Lys Val Asp Ser Gly Val Asp Arg His
225                 230                 235                 240

His Leu Met Ala Ala Leu Ser Ala Tyr Ala Ala Gln Arg Pro Pro Ala
                245                 250                 255

Pro Pro Gly Glu Gly Ser Leu Glu Pro Gln Tyr Leu Leu Arg Ala Pro
            260                 265                 270

Ser Arg Met Pro Arg Pro Leu Leu Ala Pro Ala Ala Pro Gln Lys Trp
        275                 280                 285

Pro Ser Pro Leu Gly Asp Ser Glu Asp Pro Ser Ser Thr Gly Asp Gly
    290                 295                 300

Ala Arg Ile His Thr Leu Leu Lys Asp Leu Gln Arg Gln Pro Ala Glu
305                 310                 315                 320

Val Arg Gly Leu Ser Gly Leu Glu Leu Asp Gly Met Ala Glu Leu Met
                325                 330                 335

Ala Gly Leu Met Gln Gly Val Asp His Gly Val Ala Arg Gly Ser Pro
            340                 345                 350

Gly Arg Ala Ala Leu Gly Glu Ser Gly Glu Gln Ala Asp Gly Pro Lys
        355                 360                 365

Ala Thr Leu Arg Gly Asp Ser Phe Pro Asp Asp Gly Val Gln Asp Asp
    370                 375                 380

Asp Asp Arg Leu Tyr Gln Glu Val His Arg Leu Ser Ala Thr Leu Gly
385                 390                 395                 400

Gly Leu Leu Gln Asp His Gly Ser Arg Leu Leu Pro Gly Ala Leu Pro
                405                 410                 415

Phe Ala Arg Pro Leu Asp Met Glu Arg Lys Lys Ser Glu His Pro Glu
            420                 425                 430

Ser Ser Leu Ser Ser Glu Glu Glu Thr Ala Gly Val Glu Asn Val Lys
```

```
        435                 440                 445

Ser Gln Thr Tyr Ser Lys Asp Leu Leu Gly Gln Gln Pro His Ser Glu
    450                 455                 460

Pro Gly Ala Ala Ala Phe Gly Glu Leu Gln Asn Gln Met Pro Gly Pro
465                 470                 475                 480

Ser Lys Glu Glu Gln Ser Leu Pro Ala Gly Ala Gln Glu Ala Leu Ser
                485                 490                 495

Asp Gly Leu Gln Leu Glu Val Gln Pro Ser Glu Glu Glu Ala Arg Gly
            500                 505                 510

Tyr Ile Val Thr Asp Arg Asp Pro Leu Arg Pro Glu Glu Gly Arg Arg
        515                 520                 525

Leu Val Glu Asp Val Ala Arg Leu Leu Gln Val Pro Ser Ser Ala Phe
    530                 535                 540

Ala Asp Val Glu Val Leu Gly Pro Ala Val Thr Phe Lys Val Ser Ala
545                 550                 555                 560

Asn Val Gln Asn Val Thr Thr Glu Asp Val Glu Lys Ala Thr Val Asp
                565                 570                 575

Asn Lys Asp Lys Leu Glu Glu Thr Ser Gly Leu Lys Ile Leu Gln Thr
            580                 585                 590

Gly Val Gly Ser Lys Ser Lys Leu Lys Phe Leu Pro Pro Gln Ala Glu
        595                 600                 605

Gln Glu Asp Ser Thr Lys Phe Ile Ala Leu Thr Leu Val Ser Leu Ala
    610                 615                 620

Cys Ile Leu Gly Val Leu Leu Ala Ser Gly Leu Ile Tyr Cys Leu Arg
625                 630                 635                 640

His Ser Ser Gln His Arg Leu Lys Glu Lys Leu Ser Gly Leu Gly Gly
                645                 650                 655

Asp Pro Gly Ala Asp Ala Thr Ala Ala Tyr Gln Glu Leu Cys Arg Gln
            660                 665                 670

Arg Met Ala Thr Arg Pro Pro Asp Arg Pro Glu Gly Pro His Thr Ser
        675                 680                 685
```

```
Arg Ile Ser Ser Val Ser Ser Gln Phe Ser Asp Gly Pro Ile Pro Ser
    690                 695                 700

Pro Ser Ala Arg Ser Ser Ala Ser Ser Trp Ser Glu Glu Pro Val Gln
705                 710                 715                 720

Ser Asn Met Asp Ile Ser Thr Gly His Met Ile Leu Ser Tyr Met Glu
                725                 730                 735

Asp His Leu Lys Asn Lys Asn Arg Leu Glu Lys Glu Trp Glu Ala Leu
            740                 745                 750

Cys Ala Tyr Gln Ala Glu Pro Asn Ser Ser Phe Val Ala Gln Arg Glu
        755                 760                 765

Glu Asn Val Pro Lys Asn Arg Ser Leu Ala Val Leu Thr Tyr Asp His
    770                 775                 780

Ser Arg Val Leu Leu Lys Ala Glu Asn Ser His Ser His Ser Asp Tyr
785                 790                 795                 800

Ile Asn Ala Ser Pro Ile Met Asp His Asp Pro Arg Asn Pro Ala Tyr
                805                 810                 815

Ile Ala Thr Gln Gly Pro Leu Pro Ala Thr Val Ala Asp Phe Trp Gln
            820                 825                 830

Met Val Trp Glu Ser Gly Cys Val Val Ile Val Met Leu Thr Pro Leu
        835                 840                 845

Ala Glu Asn Gly Val Arg Gln Cys Tyr His Tyr Trp Pro Asp Glu Gly
    850                 855                 860

Ser Asn Leu Tyr His Ile Tyr Glu Val Asn Leu Val Ser Glu His Ile
865                 870                 875                 880

Trp Cys Glu Asp Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Leu Gln
                885                 890                 895

Thr Asn Glu Thr Arg Thr Val Thr Gln Phe His Phe Leu Ser Trp Tyr
            900                 905                 910

Asp Arg Gly Val Pro Ser Ser Ser Arg Ser Leu Leu Asp Phe Arg Arg
        915                 920                 925
```

```
Lys Val Asn Lys Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His
    930                 935                 940

Cys Ser Asp Gly Ala Gly Arg Ser Gly Thr Tyr Val Leu Ile Asp Met
945                 950                 955                 960

Val Leu Asn Lys Met Ala Lys Gly Ala Lys Glu Ile Asp Ile Ala Ala
                965                 970                 975

Thr Leu Glu His Leu Arg Asp Gln Arg Pro Gly Met Val Gln Thr Lys
            980                 985                 990

Glu Gln Phe Glu Phe Ala Leu Thr  Ala Val Ala Glu Glu  Val Asn Ala
        995                 1000                1005

Ile Leu  Lys Ala Leu Pro Gln
    1010                1015
```

<210> 100
<211> 1480
<212> PRT
<213> Homo sapiens

<400> 100

```
Met Gln Arg Ser Pro Leu Glu Lys Ala Ser Val Val Ser Lys Leu Phe
1               5                   10                  15

Phe Ser Trp Thr Arg Pro Ile Leu Arg Lys Gly Tyr Arg Gln Arg Leu
            20                  25                  30

Glu Leu Ser Asp Ile Tyr Gln Ile Pro Ser Val Asp Ser Ala Asp Asn
        35                  40                  45

Leu Ser Glu Lys Leu Glu Arg Glu Trp Asp Arg Glu Leu Ala Ser Lys
    50                  55                  60

Lys Asn Pro Lys Leu Ile Asn Ala Leu Arg Arg Cys Phe Phe Trp Arg
65                  70                  75                  80

Phe Met Phe Tyr Gly Ile Phe Leu Tyr Leu Gly Glu Val Thr Lys Ala
                85                  90                  95

Val Gln Pro Leu Leu Leu Gly Arg Ile Ile Ala Ser Tyr Asp Pro Asp
            100                 105                 110

Asn Lys Glu Glu Arg Ser Ile Ala Ile Tyr Leu Gly Ile Gly Leu Cys
```

115 120 125

Leu Leu Phe Ile Val Arg Thr Leu Leu Leu His Pro Ala Ile Phe Gly
130 135 140

Leu His His Ile Gly Met Gln Met Arg Ile Ala Met Phe Ser Leu Ile
145 150 155 160

Tyr Lys Lys Thr Leu Lys Leu Ser Ser Arg Val Leu Asp Lys Ile Ser
165 170 175

Ile Gly Gln Leu Val Ser Leu Leu Ser Asn Asn Leu Asn Lys Phe Asp
180 185 190

Glu Gly Leu Ala Leu Ala His Phe Val Trp Ile Ala Pro Leu Gln Val
195 200 205

Ala Leu Leu Met Gly Leu Ile Trp Glu Leu Leu Gln Ala Ser Ala Phe
210 215 220

Cys Gly Leu Gly Phe Leu Ile Val Leu Ala Leu Phe Gln Ala Gly Leu
225 230 235 240

Gly Arg Met Met Met Lys Tyr Arg Asp Gln Arg Ala Gly Lys Ile Ser
245 250 255

Glu Arg Leu Val Ile Thr Ser Glu Met Ile Glu Asn Ile Gln Ser Val
260 265 270

Lys Ala Tyr Cys Trp Glu Glu Ala Met Glu Lys Met Ile Glu Asn Leu
275 280 285

Arg Gln Thr Glu Leu Lys Leu Thr Arg Lys Ala Ala Tyr Val Arg Tyr
290 295 300

Phe Asn Ser Ser Ala Phe Phe Phe Ser Gly Phe Phe Val Val Phe Leu
305 310 315 320

Ser Val Leu Pro Tyr Ala Leu Ile Lys Gly Ile Ile Leu Arg Lys Ile
325 330 335

Phe Thr Thr Ile Ser Phe Cys Ile Val Leu Arg Met Ala Val Thr Arg
340 345 350

Gln Phe Pro Trp Ala Val Gln Thr Trp Tyr Asp Ser Leu Gly Ala Ile
355 360 365

```
Asn Lys Ile Gln Asp Phe Leu Gln Lys Gln Glu Tyr Lys Thr Leu Glu
    370                 375                 380

Tyr Asn Leu Thr Thr Thr Glu Val Val Met Glu Asn Val Thr Ala Phe
385                 390                 395                 400

Trp Glu Glu Gly Phe Gly Glu Leu Phe Glu Lys Ala Lys Gln Asn Asn
                405                 410                 415

Asn Asn Arg Lys Thr Ser Asn Gly Asp Asp Ser Leu Phe Phe Ser Asn
            420                 425                 430

Phe Ser Leu Leu Gly Thr Pro Val Leu Lys Asp Ile Asn Phe Lys Ile
        435                 440                 445

Glu Arg Gly Gln Leu Leu Ala Val Ala Gly Ser Thr Gly Ala Gly Lys
    450                 455                 460

Thr Ser Leu Leu Met Met Ile Met Gly Glu Leu Glu Pro Ser Glu Gly
465                 470                 475                 480

Lys Ile Lys His Ser Gly Arg Ile Ser Phe Cys Ser Gln Phe Ser Trp
                485                 490                 495

Ile Met Pro Gly Thr Ile Lys Glu Asn Ile Ile Phe Gly Val Ser Tyr
            500                 505                 510

Asp Glu Tyr Arg Tyr Arg Ser Val Ile Lys Ala Cys Gln Leu Glu Glu
        515                 520                 525

Asp Ile Ser Lys Phe Ala Glu Lys Asp Asn Ile Val Leu Gly Glu Gly
    530                 535                 540

Gly Ile Thr Leu Ser Gly Gly Gln Arg Ala Arg Ile Ser Leu Ala Arg
545                 550                 555                 560

Ala Val Tyr Lys Asp Ala Asp Leu Tyr Leu Leu Asp Ser Pro Phe Gly
                565                 570                 575

Tyr Leu Asp Val Leu Thr Glu Lys Glu Ile Phe Glu Ser Cys Val Cys
            580                 585                 590

Lys Leu Met Ala Asn Lys Thr Arg Ile Leu Val Thr Ser Lys Met Glu
        595                 600                 605
```

His Leu Lys Lys Ala Asp Lys Ile Leu Ile Leu Asn Glu Gly Ser Ser
610 615 620

Tyr Phe Tyr Gly Thr Phe Ser Glu Leu Gln Asn Leu Gln Pro Asp Phe
625 630 635 640

Ser Ser Lys Leu Met Gly Cys Asp Ser Phe Asp Gln Phe Ser Ala Glu
645 650 655

Arg Arg Asn Ser Ile Leu Thr Glu Thr Leu His Arg Phe Ser Leu Glu
660 665 670

Gly Asp Ala Pro Val Ser Trp Thr Glu Thr Lys Lys Gln Ser Phe Lys
675 680 685

Gln Thr Gly Glu Phe Gly Glu Lys Arg Lys Asn Ser Ile Leu Asn Pro
690 695 700

Ile Asn Ser Ile Arg Lys Phe Ser Ile Val Gln Lys Thr Pro Leu Gln
705 710 715 720

Met Asn Gly Ile Glu Glu Asp Ser Asp Glu Pro Leu Glu Arg Arg Leu
725 730 735

Ser Leu Val Pro Asp Ser Glu Gln Gly Glu Ala Ile Leu Pro Arg Ile
740 745 750

Ser Val Ile Ser Thr Gly Pro Thr Leu Gln Ala Arg Arg Arg Gln Ser
755 760 765

Val Leu Asn Leu Met Thr His Ser Val Asn Gln Gly Gln Asn Ile His
770 775 780

Arg Lys Thr Thr Ala Ser Thr Arg Lys Val Ser Leu Ala Pro Gln Ala
785 790 795 800

Asn Leu Thr Glu Leu Asp Ile Tyr Ser Arg Arg Leu Ser Gln Glu Thr
805 810 815

Gly Leu Glu Ile Ser Glu Glu Ile Asn Glu Glu Asp Leu Lys Glu Cys
820 825 830

Leu Phe Asp Asp Met Glu Ser Ile Pro Ala Val Thr Thr Trp Asn Thr
835 840 845

```
Tyr Leu Arg Tyr Ile Thr Val His Lys Ser Leu Ile Phe Val Leu Ile
     850                 855                 860

Trp Cys Leu Val Ile Phe Leu Ala Glu Val Ala Ala Ser Leu Val Val
865                 870                 875                 880

Leu Trp Leu Leu Gly Asn Thr Pro Leu Gln Asp Lys Gly Asn Ser Thr
                885                 890                 895

His Ser Arg Asn Asn Ser Tyr Ala Val Ile Ile Thr Ser Thr Ser Ser
            900                 905                 910

Tyr Tyr Val Phe Tyr Ile Tyr Val Gly Val Ala Asp Thr Leu Leu Ala
        915                 920                 925

Met Gly Phe Phe Arg Gly Leu Pro Leu Val His Thr Leu Ile Thr Val
    930                 935                 940

Ser Lys Ile Leu His His Lys Met Leu His Ser Val Leu Gln Ala Pro
945                 950                 955                 960

Met Ser Thr Leu Asn Thr Leu Lys Ala Gly Gly Ile Leu Asn Arg Phe
                965                 970                 975

Ser Lys Asp Ile Ala Ile Leu Asp Asp Leu Leu Pro Leu Thr Ile Phe
            980                 985                 990

Asp Phe Ile Gln Leu Leu Leu Ile  Val Ile Gly Ala Ile  Ala Val Val
        995                 1000                1005

Ala Val  Leu Gln Pro Tyr Ile  Phe Val Ala Thr Val  Pro Val Ile
    1010                1015                1020

Val Ala  Phe Ile Met Leu Arg  Ala Tyr Phe Leu Gln  Thr Ser Gln
    1025                1030                1035

Gln Leu  Lys Gln Leu Glu Ser  Glu Gly Arg Ser Pro  Ile Phe Thr
    1040                1045                1050

His Leu  Val Thr Ser Leu Lys  Gly Leu Trp Thr Leu  Arg Ala Phe
    1055                1060                1065

Gly Arg  Gln Pro Tyr Phe Glu  Thr Leu Phe His Lys  Ala Leu Asn
    1070                1075                1080

Leu His  Thr Ala Asn Trp Phe  Leu Tyr Leu Ser Thr  Leu Arg Trp
```

```
1085                1090                1095

Phe Gln Met Arg Ile Glu Met Ile Phe Val Ile Phe Phe Ile Ala
1100                1105                1110

Val Thr Phe Ile Ser Ile Leu Thr Thr Gly Glu Gly Glu Gly Arg
1115                1120                1125

Val Gly Ile Ile Leu Thr Leu Ala Met Asn Ile Met Ser Thr Leu
1130                1135                1140

Gln Trp Ala Val Asn Ser Ser Ile Asp Val Asp Ser Leu Met Arg
1145                1150                1155

Ser Val Ser Arg Val Phe Lys Phe Ile Asp Met Pro Thr Glu Gly
1160                1165                1170

Lys Pro Thr Lys Ser Thr Lys Pro Tyr Lys Asn Gly Gln Leu Ser
1175                1180                1185

Lys Val Met Ile Ile Glu Asn Ser His Val Lys Lys Asp Asp Ile
1190                1195                1200

Trp Pro Ser Gly Gly Gln Met Thr Val Lys Asp Leu Thr Ala Lys
1205                1210                1215

Tyr Thr Glu Gly Gly Asn Ala Ile Leu Glu Asn Ile Ser Phe Ser
1220                1225                1230

Ile Ser Pro Gly Gln Arg Val Gly Leu Leu Gly Arg Thr Gly Ser
1235                1240                1245

Gly Lys Ser Thr Leu Leu Ser Ala Phe Leu Arg Leu Leu Asn Thr
1250                1255                1260

Glu Gly Glu Ile Gln Ile Asp Gly Val Ser Trp Asp Ser Ile Thr
1265                1270                1275

Leu Gln Gln Trp Arg Lys Ala Phe Gly Val Ile Pro Gln Lys Val
1280                1285                1290

Phe Ile Phe Ser Gly Thr Phe Arg Lys Asn Leu Asp Pro Tyr Glu
1295                1300                1305

Gln Trp Ser Asp Gln Glu Ile Trp Lys Val Ala Asp Glu Val Gly
1310                1315                1320
```

```
Leu Arg  Ser Val Ile Glu Gln  Phe Pro Gly Lys Leu  Asp Phe Val
    1325                 1330                 1335

Leu Val  Asp Gly Gly Cys Val  Leu Ser His Gly His  Lys Gln Leu
    1340                 1345                 1350

Met Cys  Leu Ala Arg Ser Val  Leu Ser Lys Ala Lys  Ile Leu Leu
    1355                 1360                 1365

Leu Asp  Glu Pro Ser Ala His  Leu Asp Pro Val Thr  Tyr Gln Ile
    1370                 1375                 1380

Ile Arg  Arg Thr Leu Lys Gln  Ala Phe Ala Asp Cys  Thr Val Ile
    1385                 1390                 1395

Leu Cys  Glu His Arg Ile Glu  Ala Met Leu Glu Cys  Gln Gln Phe
    1400                 1405                 1410

Leu Val  Ile Glu Glu Asn Lys  Val Arg Gln Tyr Asp  Ser Ile Gln
    1415                 1420                 1425

Lys Leu  Leu Asn Glu Arg Ser  Leu Phe Arg Gln Ala  Ile Ser Pro
    1430                 1435                 1440

Ser Asp  Arg Val Lys Leu Phe  Pro His Arg Asn Ser  Ser Lys Cys
    1445                 1450                 1455

Lys Ser  Lys Pro Gln Ile Ala  Ala Leu Lys Glu Glu  Thr Glu Glu
    1460                 1465                 1470

Glu Val  Gln Asp Thr Arg Leu
    1475                 1480


<210>  101
<211>  270
<212>  PRT
<213>  Homo sapiens

<400>  101

Met Lys Pro Lys Met Lys Tyr Ser Thr Asn Lys Ile Ser Thr Ala Lys
1               5                  10                  15

Trp Lys Asn Thr Ala Ser Lys Ala Leu Cys Phe Lys Leu Gly Lys Ser
            20                  25                  30
```

```
Gln Gln Lys Ala Lys Glu Val Cys Pro Met Tyr Phe Met Lys Leu Arg
        35                  40                  45

Ser Gly Leu Met Ile Lys Lys Glu Ala Cys Tyr Phe Arg Arg Glu Thr
    50                  55                  60

Thr Lys Arg Pro Ser Leu Lys Thr Gly Arg Lys His Lys Arg His Leu
65                  70                  75                  80

Val Leu Ala Ala Cys Gln Gln Gln Ser Thr Val Glu Cys Phe Ala Phe
                85                  90                  95

Gly Ile Ser Gly Val Gln Lys Tyr Thr Arg Ala Leu His Asp Ser Ser
            100                 105                 110

Ile Thr Gly Ile Ser Pro Ile Thr Glu Tyr Leu Ala Ser Leu Ser Thr
        115                 120                 125

Tyr Asn Asp Gln Ser Ile Thr Phe Ala Leu Glu Asp Glu Ser Tyr Glu
    130                 135                 140

Ile Tyr Val Glu Asp Leu Lys Lys Asp Glu Lys Lys Asp Lys Val Leu
145                 150                 155                 160

Leu Ser Tyr Tyr Glu Ser Gln His Pro Ser Asn Glu Ser Gly Asp Gly
                165                 170                 175

Val Asp Gly Lys Met Leu Met Val Thr Leu Ser Pro Thr Lys Asp Phe
            180                 185                 190

Trp Leu His Ala Asn Asn Lys Glu His Ser Val Glu Leu His Lys Cys
        195                 200                 205

Glu Lys Pro Leu Pro Asp Gln Ala Phe Phe Val Leu His Asn Met His
    210                 215                 220

Ser Asn Cys Val Ser Phe Glu Cys Lys Thr Asp Pro Gly Val Phe Ile
225                 230                 235                 240

Gly Val Lys Asp Asn His Leu Ala Leu Ile Lys Val Asp Ser Ser Glu
                245                 250                 255

Asn Leu Cys Thr Glu Asn Ile Leu Phe Lys Leu Ser Glu Thr
            260                 265                 270
```

<210> 102
<211> 328

<212> PRT
<213> Homo sapiens

<400> 102

```
Met Leu Pro Arg Val Gly Cys Pro Ala Leu Pro Leu Pro Pro Pro Pro
1               5                   10                  15

Leu Leu Pro Leu Leu Pro Leu Leu Leu Leu Leu Leu Gly Ala Ser Gly
            20                  25                  30

Gly Gly Gly Gly Ala Arg Ala Glu Val Leu Phe Arg Cys Pro Pro Cys
        35                  40                  45

Thr Pro Glu Arg Leu Ala Ala Cys Gly Pro Pro Pro Val Ala Pro Pro
    50                  55                  60

Ala Ala Val Ala Ala Val Ala Gly Gly Ala Arg Met Pro Cys Ala Glu
65                  70                  75                  80

Leu Val Arg Glu Pro Gly Cys Gly Cys Cys Ser Val Cys Ala Arg Leu
                85                  90                  95

Glu Gly Glu Ala Cys Gly Val Tyr Thr Pro Arg Cys Gly Gln Gly Leu
            100                 105                 110

Arg Cys Tyr Pro His Pro Gly Ser Glu Leu Pro Leu Gln Ala Leu Val
        115                 120                 125

Met Gly Glu Gly Thr Cys Glu Lys Arg Arg Asp Ala Glu Tyr Gly Ala
    130                 135                 140

Ser Pro Glu Gln Val Ala Asp Asn Gly Asp Asp His Ser Glu Gly Gly
145                 150                 155                 160

Leu Val Glu Asn His Val Asp Ser Thr Met Asn Met Leu Gly Gly Gly
                165                 170                 175

Gly Ser Ala Gly Arg Lys Pro Leu Lys Ser Gly Met Lys Glu Leu Ala
            180                 185                 190

Val Phe Arg Glu Lys Val Thr Glu Gln His Arg Gln Met Gly Lys Gly
        195                 200                 205

Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro Pro
    210                 215                 220
```

```
Pro Ala Arg Thr Pro Cys Gln Gln Glu Leu Asp Gln Val Leu Glu Arg
225                 230                 235                 240

Ile Ser Thr Met Arg Leu Pro Asp Glu Arg Gly Pro Leu Glu His Leu
                245                 250                 255

Tyr Ser Leu His Ile Pro Asn Cys Asp Lys His Gly Leu Tyr Asn Leu
            260                 265                 270

Lys Gln Cys Lys Met Ser Leu Asn Gly Gln Arg Gly Glu Cys Trp Cys
        275                 280                 285

Val Asn Pro Asn Thr Gly Lys Leu Ile Gln Gly Ala Pro Thr Ile Arg
    290                 295                 300

Gly Asp Pro Glu Cys His Leu Phe Tyr Asn Glu Gln Gln Glu Ala Cys
305                 310                 315                 320

Gly Val His Thr Gln Arg Met Gln
                325
```

<210> 103
<211> 148
<212> PRT
<213> Homo sapiens

<400> 103

```
Met Asp Pro Ala Pro Arg Glu Pro His Ser Thr Ser Leu Leu Leu Val
1               5                   10                  15

Phe Phe Leu Phe Gly Ala Pro Leu Asp Ser Leu Pro Ser Met Lys Ala
            20                  25                  30

Leu Ser Pro Val Arg Gly Cys Tyr Glu Ala Val Cys Cys Leu Ser Glu
        35                  40                  45

Arg Ser Leu Ala Ile Ala Arg Gly Arg Gly Lys Gly Pro Ala Ala Glu
    50                  55                  60

Glu Pro Leu Ser Leu Leu Asp Asp Met Asn His Cys Tyr Ser Arg Leu
65                  70                  75                  80

Arg Glu Leu Val Pro Gly Val Pro Arg Gly Thr Gln Leu Ser Gln Val
                85                  90                  95

Glu Ile Leu Gln Arg Val Ile Asp Tyr Ile Leu Asp Leu Gln Val Val
100                 105                 110
```

Leu Ala Glu Pro Ala Pro Gly Pro Pro Asp Gly Pro His Leu Pro Ile
115 120 125

Gln Thr Ala Glu Leu Ala Pro Glu Leu Val Ile Ser Asn Asp Lys Arg
130 135 140

Ser Phe Cys His
145

<210> 104
<211> 255
<212> PRT
<213> Homo sapiens

<400> 104

Met Ile Leu Asn Lys Ala Leu Leu Leu Gly Ala Leu Ala Leu Thr Thr
1 5 10 15

Val Met Ser Pro Cys Gly Gly Glu Asp Ile Val Ala Asp His Val Ala
20 25 30

Ser Cys Gly Val Asn Leu Tyr Gln Phe Tyr Gly Pro Ser Gly Gln Tyr
35 40 45

Thr His Glu Phe Asp Gly Asp Glu Gln Phe Tyr Val Asp Leu Glu Arg
50 55 60

Lys Glu Thr Ala Trp Arg Trp Pro Glu Phe Ser Lys Phe Gly Gly Phe
65 70 75 80

Asp Pro Gln Gly Ala Leu Arg Asn Met Ala Val Ala Lys His Asn Leu
85 90 95

Asn Ile Met Ile Lys Arg Tyr Asn Ser Thr Ala Ala Thr Asn Glu Val
100 105 110

Pro Glu Val Thr Val Phe Ser Lys Ser Pro Val Thr Leu Gly Gln Pro
115 120 125

Asn Thr Leu Ile Cys Leu Val Asp Asn Ile Phe Pro Pro Val Val Asn
130 135 140

Ile Thr Trp Leu Ser Asn Gly Gln Ser Val Thr Glu Asp Val Ser Glu
145 150 155 160

```
Thr Ser Phe Leu Ser Lys Ser Asp His Ser Phe Phe Lys Ile Ser Tyr
                165                 170                 175

Leu Thr Phe Leu Pro Ser Ala Asp Glu Ile Tyr Asp Cys Lys Val Glu
            180                 185                 190

His Trp Gly Leu Asp Gln Pro Leu Leu Lys His Trp Glu Pro Glu Ile
        195                 200                 205

Pro Ala Pro Met Ser Glu Leu Thr Glu Thr Val Val Cys Ala Leu Gly
    210                 215                 220

Leu Ser Val Gly Leu Met Gly Ile Val Val Gly Thr Val Phe Ile Ile
225                 230                 235                 240

Gln Gly Leu Arg Ser Val Gly Ala Ser Arg His Gln Gly Pro Leu
                245                 250                 255
```

<210> 105
<211> 265
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (6)..(6)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (12)..(12)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (21)..(21)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (23)..(23)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (27)..(27)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (33)..(33)
<223> Xaa can be any naturally occurring amino acid

<220>

<221> misc_feature<222> (55)..(55)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (73)..(73)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (97)..(97)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (99)..(99)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (111)..(111)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (115)..(115)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (148)..(148)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (156)..(156)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (163)..(163)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (176)..(176)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (215)..(215)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (217)..(217)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220>
<221> misc_feature
<222> (256)..(256)
<223> Xaa can be any naturally occurring amino acid

<400> 105

Asn His Leu Gln Leu Xaa Arg Met Met Val Pro Xaa Ser Pro Pro Ala
1 5 10 15

Cys Arg Pro Arg Xaa Pro Xaa Cys Asn Lys Xaa Cys Cys Ser Pro Ser
20 25 30

Xaa Leu Ser Thr Arg Pro Thr Thr Tyr Thr Gly Gly Thr Pro Arg Glu
35 40 45

Pro His Leu Gly Lys Pro Xaa Gly His Gln Ser Ser Thr Cys Thr Lys
50 55 60

His Val Pro Leu Arg Gly Cys His Xaa Pro Pro Gln Thr Pro Lys Pro
65 70 75 80

Pro Pro Ala Cys Arg Ala His Gln Ser Met Ser Arg Asn Lys Trp Arg
85 90 95

Xaa Arg Xaa Ser Gln Arg Asp Ala Thr Ser Pro Pro Thr Pro Xaa Pro
100 105 110

Glu Leu Xaa Pro Ser Asp Trp Ala Cys Thr Gly Thr Asp Lys Arg His
115 120 125

Pro Glu Leu Thr Leu Gln Arg Cys Arg Gly His Pro Glu Ser Ser Phe
130 135 140

Gln Leu Ser Xaa Ser Pro Lys Val Gly Lys Leu Xaa Ile Leu Gly Ala
145 150 155 160

Tyr Gly Xaa Phe Trp Arg Arg Lys Pro Leu Ala Trp Ser Gln Lys Xaa
165 170 175

Lys Glu Leu Pro Val Pro Trp Leu Phe Cys Pro Ala Ser Pro Pro Arg
180 185 190

Glu Ala Asn Gln Trp Pro Met Trp Arg Arg Ser Pro Cys Cys Arg Ile
195 200 205

Gln Arg Leu Leu Gly Ala Xaa Leu Xaa Leu Xaa Pro Gly Asn Arg Ser
210 215 220

Ser His Glu Thr Ser Ser Arg Leu Pro Phe Ser Gly Gln Pro Gln Arg
225 230 235 240

Gln Pro His Asn Ala Cys His Thr Ser Tyr His Pro Ser Arg Leu Xaa
245 250 255

Pro Ser Arg Pro Leu Ser Gly Leu Ile
260 265

<210> 106
<211> 907
<212> PRT
<213> Homo sapiens

<400> 106

Met Asp Thr Ser Arg Leu Gly Val Leu Leu Ser Leu Pro Val Leu Leu
1 5 10 15

Gln Leu Ala Thr Gly Gly Ser Ser Pro Arg Ser Gly Val Leu Leu Arg
20 25 30

Gly Cys Pro Thr His Cys His Cys Glu Pro Asp Gly Arg Met Leu Leu
35 40 45

Arg Val Asp Cys Ser Asp Leu Gly Leu Ser Glu Leu Pro Ser Asn Leu
50 55 60

Ser Val Phe Thr Ser Tyr Leu Asp Leu Ser Met Asn Asn Ile Ser Gln
65 70 75 80

Leu Leu Pro Asn Pro Leu Pro Ser Leu Arg Phe Leu Glu Glu Leu Arg
85 90 95

Leu Ala Gly Asn Ala Leu Thr Tyr Ile Pro Lys Gly Ala Phe Thr Gly
100 105 110

Leu Tyr Ser Leu Lys Val Leu Met Leu Gln Asn Asn Gln Leu Arg His
115 120 125

Val Pro Thr Glu Ala Leu Gln Asn Leu Arg Ser Leu Gln Ser Leu Arg
130 135 140

Leu Asp Ala Asn His Ile Ser Tyr Val Pro Pro Ser Cys Phe Ser Gly
145 150 155 160

```
Leu His Ser Leu Arg His Leu Trp Leu Asp Asp Asn Ala Leu Thr Glu
                165                 170                 175

Ile Pro Val Gln Ala Phe Arg Ser Leu Ser Ala Leu Gln Ala Met Thr
            180                 185                 190

Leu Ala Leu Asn Lys Ile His His Ile Pro Asp Tyr Ala Phe Gly Asn
        195                 200                 205

Leu Ser Ser Leu Val Val Leu His Leu His Asn Asn Arg Ile His Ser
    210                 215                 220

Leu Gly Lys Lys Cys Phe Asp Gly Leu His Ser Leu Glu Thr Leu Asp
225                 230                 235                 240

Leu Asn Tyr Asn Asn Leu Asp Glu Phe Pro Thr Ala Ile Arg Thr Leu
                245                 250                 255

Ser Asn Leu Lys Glu Leu Gly Phe His Ser Asn Asn Ile Arg Ser Ile
            260                 265                 270

Pro Glu Lys Ala Phe Val Gly Asn Pro Ser Leu Ile Thr Ile His Phe
        275                 280                 285

Tyr Asp Asn Pro Ile Gln Phe Val Gly Arg Ser Ala Phe Gln His Leu
    290                 295                 300

Pro Glu Leu Arg Thr Leu Thr Leu Asn Gly Ala Ser Gln Ile Thr Glu
305                 310                 315                 320

Phe Pro Asp Leu Thr Gly Thr Ala Asn Leu Glu Ser Leu Thr Leu Thr
                325                 330                 335

Gly Ala Gln Ile Ser Ser Leu Pro Gln Thr Val Cys Asn Gln Leu Pro
            340                 345                 350

Asn Leu Gln Val Leu Asp Leu Ser Tyr Asn Leu Leu Glu Asp Leu Pro
        355                 360                 365

Ser Phe Ser Val Cys Gln Lys Leu Gln Lys Ile Asp Leu Arg His Asn
    370                 375                 380

Glu Ile Tyr Glu Ile Lys Val Asp Thr Phe Gln Gln Leu Leu Ser Leu
385                 390                 395                 400
```

```
Arg Ser Leu Asn Leu Ala Trp Asn Lys Ile Ala Ile Ile His Pro Asn
                405                 410                 415

Ala Phe Ser Thr Leu Pro Ser Leu Ile Lys Leu Asp Leu Ser Ser Asn
            420                 425                 430

Leu Leu Ser Ser Phe Pro Ile Thr Gly Leu His Gly Leu Thr His Leu
        435                 440                 445

Lys Leu Thr Gly Asn His Ala Leu Gln Ser Leu Ile Ser Ser Glu Asn
    450                 455                 460

Phe Pro Glu Leu Lys Val Ile Glu Met Pro Tyr Ala Tyr Gln Cys Cys
465                 470                 475                 480

Ala Phe Gly Val Cys Glu Asn Ala Tyr Lys Ile Ser Asn Gln Trp Asn
                485                 490                 495

Lys Gly Asp Asn Ser Ser Met Asp Asp Leu His Lys Lys Asp Ala Gly
            500                 505                 510

Met Phe Gln Ala Gln Asp Glu Arg Asp Leu Glu Asp Phe Leu Leu Asp
        515                 520                 525

Phe Glu Glu Asp Leu Lys Ala Leu His Ser Val Gln Cys Ser Pro Ser
    530                 535                 540

Pro Gly Pro Phe Lys Pro Cys Glu His Leu Leu Asp Gly Trp Leu Ile
545                 550                 555                 560

Arg Ile Gly Val Trp Thr Ile Ala Val Leu Ala Leu Thr Cys Asn Ala
                565                 570                 575

Leu Val Thr Ser Thr Val Phe Arg Ser Pro Leu Tyr Ile Ser Pro Ile
            580                 585                 590

Lys Leu Leu Ile Gly Val Ile Ala Ala Val Asn Met Leu Thr Gly Val
        595                 600                 605

Ser Ser Ala Val Leu Ala Gly Val Asp Ala Phe Thr Phe Gly Ser Phe
    610                 615                 620

Ala Arg His Gly Ala Trp Trp Glu Asn Gly Val Gly Cys His Val Ile
625                 630                 635                 640
```

```
Gly Phe Leu Ser Ile Phe Ala Ser Glu Ser Ser Val Phe Leu Leu Thr
                645                 650                 655

Leu Ala Ala Leu Glu Arg Gly Phe Ser Val Lys Tyr Ser Ala Lys Phe
            660                 665                 670

Glu Thr Lys Ala Pro Phe Ser Ser Leu Lys Val Ile Ile Leu Leu Cys
        675                 680                 685

Ala Leu Leu Ala Leu Thr Met Ala Ala Val Pro Leu Leu Gly Gly Ser
    690                 695                 700

Lys Tyr Gly Ala Ser Pro Leu Cys Leu Pro Leu Pro Phe Gly Glu Pro
705                 710                 715                 720

Ser Thr Met Gly Tyr Met Val Ala Leu Ile Leu Leu Asn Ser Leu Cys
                725                 730                 735

Phe Leu Met Met Thr Ile Ala Tyr Thr Lys Leu Tyr Cys Asn Leu Asp
            740                 745                 750

Lys Gly Asp Leu Glu Asn Ile Trp Asp Cys Ser Met Val Lys His Ile
        755                 760                 765

Ala Leu Leu Leu Phe Thr Asn Cys Ile Leu Asn Cys Pro Val Ala Phe
    770                 775                 780

Leu Ser Phe Ser Ser Leu Ile Asn Leu Thr Phe Ile Ser Pro Glu Val
785                 790                 795                 800

Ile Lys Phe Ile Leu Leu Val Val Val Pro Leu Pro Ala Cys Leu Asn
                805                 810                 815

Pro Leu Leu Tyr Ile Leu Phe Asn Pro His Phe Lys Glu Asp Leu Val
            820                 825                 830

Ser Leu Arg Lys Gln Thr Tyr Val Trp Thr Arg Ser Lys His Pro Ser
        835                 840                 845

Leu Met Ser Ile Asn Ser Asp Asp Val Glu Lys Gln Ser Cys Asp Ser
    850                 855                 860

Thr Gln Ala Leu Val Thr Phe Thr Ser Ser Ser Ile Thr Tyr Asp Leu
865                 870                 875                 880

Pro Pro Ser Ser Val Pro Ser Pro Ala Tyr Pro Val Thr Glu Ser Cys
```

885 890 895

His Leu Ser Ser Val Ala Phe Val Pro Cys Leu
900 905

<210> 107
<211> 361
<212> PRT
<213> Homo sapiens

<400> 107

Met Asp Pro Leu Gly Ala Ala Lys Pro Gln Trp Pro Trp Arg Arg Cys
1 5 10 15

Leu Ala Ala Leu Leu Phe Gln Leu Leu Val Ala Val Cys Phe Phe Ser
20 25 30

Tyr Leu Arg Val Ser Arg Asp Asp Ala Thr Gly Ser Pro Arg Ala Pro
35 40 45

Ser Gly Ser Ser Arg Gln Asp Thr Thr Pro Thr Arg Pro Thr Leu Leu
50 55 60

Ile Leu Leu Trp Thr Trp Pro Phe His Ile Pro Val Ala Leu Ser Arg
65 70 75 80

Cys Ser Glu Met Val Pro Gly Thr Ala Asp Cys His Ile Thr Ala Asp
85 90 95

Arg Lys Val Tyr Pro Gln Ala Asp Thr Val Ile Val His His Trp Asp
100 105 110

Ile Met Ser Asn Pro Lys Ser Arg Leu Pro Pro Ser Pro Arg Pro Gln
115 120 125

Gly Gln Arg Trp Ile Trp Phe Asn Leu Glu Pro Pro Pro Asn Cys Gln
130 135 140

His Leu Glu Ala Leu Asp Arg Tyr Phe Asn Leu Thr Met Ser Tyr Arg
145 150 155 160

Ser Asp Ser Asp Ile Phe Thr Pro Tyr Gly Trp Leu Glu Pro Trp Ser
165 170 175

Gly Gln Pro Ala His Pro Pro Leu Asn Leu Ser Ala Lys Thr Glu Leu
180 185 190

```
Val Ala Trp Ala Val Ser Asn Trp Lys Pro Asp Ser Ala Arg Val Arg
        195                 200                 205

Tyr Tyr Gln Ser Leu Gln Ala His Leu Lys Val Asp Val Tyr Gly Arg
    210                 215                 220

Ser His Lys Pro Leu Pro Lys Gly Thr Met Met Glu Thr Leu Ser Arg
225                 230                 235                 240

Tyr Lys Phe Tyr Leu Ala Phe Glu Asn Ser Leu His Pro Asp Tyr Ile
                245                 250                 255

Thr Glu Lys Leu Trp Arg Asn Ala Leu Glu Ala Trp Ala Val Pro Val
            260                 265                 270

Val Leu Gly Pro Ser Arg Ser Asn Tyr Glu Arg Phe Leu Pro Pro Asp
        275                 280                 285

Ala Phe Ile His Val Asp Asp Phe Gln Ser Pro Lys Asp Leu Ala Arg
    290                 295                 300

Tyr Leu Gln Glu Leu Asp Lys Asp His Ala Arg Tyr Leu Ser Tyr Phe
305                 310                 315                 320

Arg Trp Arg Glu Thr Leu Arg Pro Arg Ser Phe Ser Trp Ala Leu Asp
                325                 330                 335

Phe Cys Lys Ala Cys Trp Lys Leu Gln Gln Glu Ser Arg Tyr Gln Thr
            340                 345                 350

Val Arg Ser Ile Ala Ala Trp Phe Thr         355                 360
```

<210> 108
<211> 122
<212> PRT
<213> Homo sapiens

<400> 108

```
Met Glu Ala Ser Ala Leu Thr Ser Ser Ala Val Thr Ser Val Ala Lys
1               5                   10                  15

Val Val Arg Val Ala Ser Gly Ser Ala Val Val Leu Pro Leu Ala Arg
            20                  25                  30

Ile Ala Thr Val Val Ile Gly Gly Val Val Ala Met Ala Ala Val Pro
        35                  40                  45
```

Met Val Leu Ser Ala Met Gly Phe Thr Ala Ala Gly Ile Ala Ser Ser
50 55 60

Ser Ile Ala Ala Lys Met Met Ser Ala Ala Ala Ile Ala Asn Gly Gly
65 70 75 80

Gly Val Ala Ser Gly Ser Leu Val Gly Thr Leu Gln Ser Leu Gly Ala
85 90 95

Thr Gly Leu Ser Gly Leu Thr Lys Phe Ile Leu Gly Ser Ile Gly Ser
100 105 110

Ala Ile Ala Ala Val Ile Ala Arg Phe Tyr
115 120

<210> 109
<211> 375
<212> PRT
<213> Homo sapiens

<400> 109

Met Asp Ala Leu Gln Leu Ala Asn Ser Ala Phe Ala Val Asp Leu Phe
1 5 10 15

Lys Gln Leu Cys Glu Lys Glu Pro Leu Gly Asn Val Leu Phe Ser Pro
20 25 30

Ile Cys Leu Ser Thr Ser Leu Ser Leu Ala Gln Val Gly Ala Lys Gly
35 40 45

Asp Thr Ala Asn Glu Ile Gly Gln Val Leu His Phe Glu Asn Val Lys
50 55 60

Asp Ile Pro Phe Gly Phe Gln Thr Val Thr Ser Asp Val Asn Lys Leu
65 70 75 80

Ser Ser Phe Tyr Ser Leu Lys Leu Ile Lys Arg Leu Tyr Val Asp Lys
85 90 95

Ser Leu Asn Leu Ser Thr Glu Phe Ile Ser Ser Thr Lys Arg Pro Tyr
100 105 110

Ala Lys Glu Leu Glu Thr Val Asp Phe Lys Asp Lys Leu Glu Glu Thr
115 120 125

Lys Gly Gln Ile Asn Asn Ser Ile Lys Asp Leu Thr Asp Gly His Phe

```
    130                 135                 140

Glu Asn Ile Leu Ala Asp Asn Ser Val Asn Asp Gln Thr Lys Ile Leu
145                 150                 155                 160

Val Val Asn Ala Ala Tyr Phe Val Gly Lys Trp Met Lys Lys Phe Pro
                165                 170                 175

Glu Ser Glu Thr Lys Glu Cys Pro Phe Arg Leu Asn Lys Thr Asp Thr
            180                 185                 190

Lys Pro Val Gln Met Met Asn Met Glu Ala Thr Phe Cys Met Gly Asn
        195                 200                 205

Ile Asp Ser Ile Asn Cys Lys Ile Ile Glu Leu Pro Phe Gln Asn Lys
    210                 215                 220

His Leu Ser Met Phe Ile Leu Leu Pro Lys Asp Val Glu Asp Glu Ser
225                 230                 235                 240

Thr Gly Leu Glu Lys Ile Glu Lys Gln Leu Asn Ser Glu Ser Leu Ser
                245                 250                 255

Gln Trp Thr Asn Pro Ser Thr Met Ala Asn Ala Lys Val Lys Leu Ser
            260                 265                 270

Ile Pro Lys Phe Lys Val Glu Lys Met Ile Asp Pro Lys Ala Cys Leu
        275                 280                 285

Glu Asn Leu Gly Leu Lys His Ile Phe Ser Glu Asp Thr Ser Asp Phe
    290                 295                 300

Ser Gly Met Ser Glu Thr Lys Gly Val Ala Leu Ser Asn Val Ile His
305                 310                 315                 320

Lys Val Cys Leu Glu Ile Thr Glu Asp Gly Gly Asp Ser Ile Glu Val
                325                 330                 335

Pro Gly Ala Arg Ile Leu Gln His Lys Asp Glu Leu Asn Ala Asp His
            340                 345                 350

Pro Phe Ile Tyr Ile Ile Arg His Asn Lys Thr Arg Asn Ile Ile Phe
        355                 360                 365

Phe Gly Lys Phe Cys Ser Pro
    370                 375
```

<210> 110
<211> 139
<212> PRT
<213> Homo sapiens

<400> 110

Met Asp Lys Phe Trp Trp His Ala Ala Trp Gly Leu Cys Leu Val Pro
1 5 10 15

Leu Ser Leu Ala Gln Ile Asp Leu Asn Ile Thr Cys Arg Phe Ala Gly
20 25 30

Val Phe His Val Glu Lys Asn Gly Arg Tyr Ser Ile Ser Arg Thr Glu
35 40 45

Ala Ala Asp Leu Cys Lys Ala Phe Asn Ser Thr Leu Pro Thr Met Ala
50 55 60

Gln Met Glu Lys Ala Leu Ser Ile Gly Phe Glu Thr Cys Ser Leu His
65 70 75 80

Cys Ser Gln Gln Ser Lys Lys Val Trp Ala Glu Glu Lys Ala Ser Asp
85 90 95

Gln Gln Trp Gln Trp Ser Cys Gly Gly Gln Lys Ala Lys Trp Thr Gln
100 105 110

Arg Arg Gly Gln Gln Val Ser Gly Asn Gly Ala Phe Gly Glu Gln Gly
115 120 125

Val Val Arg Asn Ser Arg Pro Val Tyr Asp Ser
130 135

<210> 111
<211> 535
<212> PRT
<213> Homo sapiens

<400> 111

Met Glu Glu Gly Ala Arg His Arg Asn Asn Thr Glu Lys Lys His Pro
1 5 10 15

Gly Gly Gly Glu Ser Asp Ala Ser Pro Glu Ala Gly Ser Gly Gly Gly
20 25 30

Gly Val Ala Leu Lys Lys Glu Ile Gly Leu Val Ser Ala Cys Gly Ile
35 40 45

```
Ile Val Gly Asn Ile Ile Gly Ser Gly Ile Phe Val Ser Pro Lys Gly
    50                  55                  60

Val Leu Glu Asn Ala Gly Ser Val Gly Leu Ala Leu Ile Val Trp Ile
65                  70                  75                  80

Val Thr Gly Phe Ile Thr Val Val Gly Ala Leu Cys Tyr Ala Glu Leu
                85                  90                  95

Gly Val Thr Ile Pro Lys Ser Gly Gly Asp Tyr Ser Tyr Val Lys Asp
            100                 105                 110

Ile Phe Gly Gly Leu Ala Gly Phe Leu Arg Leu Trp Ile Ala Val Leu
        115                 120                 125

Val Ile Tyr Pro Thr Asn Gln Ala Val Ile Ala Leu Thr Phe Ser Asn
    130                 135                 140

Tyr Val Leu Gln Pro Leu Phe Pro Thr Cys Phe Pro Pro Glu Ser Gly
145                 150                 155                 160

Leu Arg Leu Leu Ala Ala Ile Cys Leu Leu Leu Leu Thr Trp Val Asn
                165                 170                 175

Cys Ser Ser Val Arg Trp Ala Thr Arg Val Gln Asp Ile Phe Thr Ala
            180                 185                 190

Gly Lys Leu Leu Ala Leu Ala Leu Ile Ile Ile Met Gly Ile Val Gln
        195                 200                 205

Ile Cys Lys Gly Glu Tyr Phe Trp Leu Glu Pro Lys Asn Ala Phe Glu
    210                 215                 220

Asn Phe Gln Glu Pro Asp Ile Gly Leu Val Ala Leu Ala Phe Leu Gln
225                 230                 235                 240

Gly Ser Phe Ala Tyr Gly Gly Trp Asn Phe Leu Asn Tyr Val Thr Glu
                245                 250                 255

Glu Leu Val Asp Pro Tyr Lys Asn Leu Pro Arg Ala Ile Phe Ile Ser
            260                 265                 270

Ile Pro Leu Val Thr Phe Val Tyr Val Phe Ala Asn Val Ala Tyr Val
        275                 280                 285
```

```
Thr Ala Met Ser Pro Gln Glu Leu Leu Ala Ser Asn Ala Val Ala Val
    290                 295                 300

Thr Phe Gly Glu Lys Leu Leu Gly Val Met Ala Trp Ile Met Pro Ile
305                 310                 315                 320

Ser Val Ala Leu Ser Thr Phe Gly Gly Val Asn Gly Ser Leu Phe Thr
                325                 330                 335

Ser Ser Arg Leu Phe Phe Ala Gly Ala Arg Glu Gly His Leu Pro Ser
            340                 345                 350

Val Leu Ala Met Ile His Val Lys Arg Cys Thr Pro Ile Pro Ala Leu
        355                 360                 365

Leu Phe Thr Cys Ile Ser Thr Leu Leu Met Leu Val Thr Ser Asp Met
    370                 375                 380

Tyr Thr Leu Ile Asn Tyr Val Gly Phe Ile Asn Tyr Leu Phe Tyr Gly
385                 390                 395                 400

Val Thr Val Ala Gly Gln Ile Val Leu Arg Trp Lys Lys Pro Asp Ile
405                 410                 415

Pro Arg Pro Ile Lys Ile Asn Leu Leu Phe Pro Ile Ile Tyr Leu Leu
            420                 425                 430

Phe Trp Ala Phe Leu Leu Val Phe Ser Leu Trp Ser Glu Pro Val Val
        435                 440                 445

Cys Gly Ile Gly Leu Ala Ile Met Leu Thr Gly Val Pro Val Tyr Phe
    450                 455                 460

Leu Gly Val Tyr Trp Gln His Lys Pro Lys Cys Phe Ser Asp Phe Ile
465                 470                 475                 480

Glu Leu Leu Thr Leu Val Ser Gln Lys Met Cys Val Val Val Tyr Pro
                485                 490                 495

Glu Val Glu Arg Gly Ser Gly Thr Glu Glu Ala Asn Glu Asp Met Glu
            500                 505                 510

Glu Gln Gln Gln Pro Met Tyr Gln Pro Thr Pro Thr Lys Asp Lys Asp
        515                 520                 525
```

```
Val Ala Gly Gln Pro Gln Pro
    530                 535


<210>  112
<211>  466
<212>  PRT
<213>  Homo sapiens

<400>  112

Met Thr Leu Lys Ala Ser Glu Gly Glu Ser Gly Gly Ser Met His Thr
1               5                   10                  15

Ala Leu Ser Asp Leu Tyr Leu Glu His Leu Leu Gln Lys Arg Ser Arg
            20                  25                  30

Pro Glu Ala Val Ser His Pro Leu Asn Thr Val Thr Glu Asp Met Tyr
        35                  40                  45

Thr Asn Gly Ser Pro Ala Pro Gly Ser Pro Ala Gln Val Lys Gly Gln
    50                  55                  60

Glu Val Arg Lys Val Arg Leu Ile Gln Phe Glu Lys Val Thr Glu Glu
65                  70                  75                  80

Pro Met Gly Ile Thr Leu Lys Leu Asn Glu Lys Gln Ser Cys Thr Val
                85                  90                  95

Ala Arg Ile Leu His Gly Gly Met Ile His Arg Gln Gly Ser Leu His
            100                 105                 110

Val Gly Asp Glu Ile Leu Glu Ile Asn Gly Thr Asn Val Thr Asn His
        115                 120                 125

Ser Val Asp Gln Leu Gln Lys Ala Met Lys Glu Thr Lys Gly Met Ile
    130                 135                 140

Ser Leu Lys Val Ile Pro Asn Gln Gln Ser Arg Leu Pro Ala Leu Gln
145                 150                 155                 160

Met Phe Met Arg Ala Gln Phe Asp Tyr Asp Pro Lys Lys Asp Asn Leu
                165                 170                 175

Ile Pro Cys Lys Glu Ala Gly Leu Lys Phe Ala Thr Gly Asp Ile Ile
            180                 185                 190

Gln Ile Ile Asn Lys Asp Asp Ser Asn Trp Trp Gln Gly Arg Val Glu
        195                 200                 205
```

```
Gly Ser Ser Lys Glu Ser Ala Gly Leu Ile Pro Ser Pro Glu Leu Gln
    210                 215                 220

Glu Trp Arg Val Ala Ser Met Ala Gln Ser Ala Pro Ser Glu Ala Pro
225                 230                 235                 240

Ser Cys Ser Pro Phe Gly Lys Lys Lys Lys Tyr Lys Asp Lys Tyr Leu
                245                 250                 255

Ala Lys His Ser Ser Ile Phe Asp Gln Leu Asp Val Val Ser Tyr Glu
            260                 265                 270

Glu Val Val Arg Leu Pro Ala Phe Lys Arg Lys Thr Leu Val Leu Ile
        275                 280                 285

Gly Ala Ser Gly Val Gly Arg Ser His Ile Lys Asn Ala Leu Leu Ser
    290                 295                 300

Gln Asn Pro Glu Lys Phe Val Tyr Pro Val Pro Tyr Thr Thr Arg Pro
305                 310                 315                 320

Pro Arg Lys Ser Glu Glu Asp Gly Lys Glu Tyr His Phe Ile Ser Thr
                325                 330                 335

Glu Glu Met Thr Arg Asn Ile Ser Ala Asn Glu Phe Leu Glu Phe Gly
            340                 345                 350

Ser Tyr Gln Gly Asn Met Phe Gly Thr Lys Phe Glu Thr Val His Gln
        355                 360                 365

Ile His Lys Gln Asn Lys Ile Ala Ile Leu Asp Ile Glu Pro Gln Thr
    370                 375                 380

Leu Lys Ile Val Arg Thr Ala Glu Leu Ser Pro Phe Ile Val Phe Ile
385                 390                 395                 400

Ala Pro Thr Asp Gln Gly Thr Gln Thr Glu Ala Leu Gln Gln Leu Gln
                405                 410                 415

Lys Asp Ser Glu Ala Ile Arg Ser Gln Tyr Ala His Tyr Phe Asp Leu
            420                 425                 430

Ser Leu Val Asn Asn Gly Val Asp Glu Thr Leu Lys Lys Leu Gln Glu
        435                 440                 445
```

```
Ala Phe Asp Gln Ala Cys Ser Ser Pro Gln Trp Val Pro Val Ser Trp
    450                 455                 460

Val Tyr
465
```

<210> 113
<211> 393
<212> PRT
<213> Homo sapiens

<400> 113

```
Met Glu Glu Pro Gln Ser Asp Pro Ser Val Glu Pro Pro Leu Ser Gln
1               5                   10                  15

Glu Thr Phe Ser Asp Leu Trp Lys Leu Leu Pro Glu Asn Asn Val Leu
            20                  25                  30

Ser Pro Leu Pro Ser Gln Ala Met Asp Asp Leu Met Leu Ser Pro Asp
        35                  40                  45

Asp Ile Glu Gln Trp Phe Thr Glu Asp Pro Gly Pro Asp Glu Ala Pro
    50                  55                  60

Arg Met Pro Glu Ala Ala Pro Pro Val Ala Pro Ala Pro Ala Ala Pro
65                  70                  75                  80

Thr Pro Ala Ala Pro Ala Pro Ala Pro Ser Trp Pro Leu Ser Ser Ser
                85                  90                  95

Val Pro Ser Gln Lys Thr Tyr Gln Gly Ser Tyr Gly Phe Arg Leu Gly
            100                 105                 110

Phe Leu His Ser Gly Thr Ala Lys Ser Val Thr Cys Thr Tyr Ser Pro
        115                 120                 125

Ala Leu Asn Lys Met Phe Cys Gln Leu Ala Lys Thr Cys Pro Val Gln
    130                 135                 140

Leu Trp Val Asp Ser Thr Pro Pro Pro Gly Thr Arg Val Arg Ala Met
145                 150                 155                 160

Ala Ile Tyr Lys Gln Ser Gln His Met Thr Glu Val Val Arg Arg Cys
                165                 170                 175

Pro His His Glu Arg Cys Ser Asp Ser Asp Gly Leu Ala Pro Pro Gln
```

```
            180                 185                 190

His Leu Ile Arg Val Glu Gly Asn Leu Arg Val Glu Tyr Leu Asp Asp
        195                 200                 205

Arg Asn Thr Phe Arg His Ser Val Val Val Pro Tyr Glu Pro Pro Glu
    210                 215                 220

Val Gly Ser Asp Cys Thr Thr Ile His Tyr Asn Tyr Met Cys Asn Ser
225                 230                 235                 240

Ser Cys Met Gly Gly Met Asn Arg Arg Pro Ile Leu Thr Ile Ile Thr
                245                 250                 255

Leu Glu Asp Ser Ser Gly Asn Leu Leu Gly Arg Asn Ser Phe Glu Val
            260                 265                 270

His Val Cys Ala Cys Pro Gly Arg Asp Arg Arg Thr Glu Glu Glu Asn
        275                 280                 285

Leu Arg Lys Lys Gly Glu Pro His His Glu Leu Pro Pro Gly Ser Thr
    290                 295                 300

Lys Arg Ala Leu Pro Asn Asn Thr Ser Ser Ser Pro Gln Pro Lys Lys
305                 310                 315                 320

Lys Pro Leu Asp Gly Glu Tyr Phe Thr Leu Gln Ile Arg Gly Arg Glu
                325                 330                 335

Arg Phe Glu Met Phe Arg Glu Leu Asn Glu Ala Leu Glu Leu Lys Asp
            340                 345                 350

Ala Gln Ala Gly Lys Glu Pro Gly Gly Ser Arg Ala His Ser Ser His
        355                 360                 365

Leu Lys Ser Lys Lys Gly Gln Ser Thr Ser Arg His Lys Lys Leu Met
    370                 375                 380

Phe Lys Thr Glu Gly Pro Asp Ser Asp
385                 390
```

<210> 114
<211> 95
<212> PRT
<213> Homo sapiens

<400> 114

```
Met Thr Glu Leu Glu Thr Ala Met Gly Met Ile Ile Asp Val Phe Ser
1               5                  10                  15

Arg Tyr Ser Gly Ser Glu Gly Ser Thr Gln Thr Leu Thr Lys Gly Glu
            20                  25                  30

Leu Lys Val Leu Met Glu Lys Glu Leu Pro Gly Phe Leu Gln Ser Gly
        35                  40                  45

Lys Asp Lys Asp Ala Val Asp Lys Leu Leu Lys Asp Leu Asp Ala Asn
    50                  55                  60

Gly Asp Ala Gln Val Asp Phe Ser Glu Phe Ile Val Phe Val Ala Ala
65                  70                  75                  80

Ile Thr Ser Ala Cys His Lys Tyr Phe Glu Lys Ala Gly Leu Lys
                85                  90                  95
```

<210> 115
<211> 120
<212> PRT
<213> Homo sapiens

<400> 115

```
Met Gly Thr Asn Phe Pro Phe Trp Val Ser Gln Leu Thr Phe Phe Lys
1               5                  10                  15

Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu
            20                  25                  30

Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser Gly Val Thr
        35                  40                  45

Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys Ala Val Leu
    50                  55                  60

Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met Phe Leu Glu
65                  70                  75                  80

Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn Lys Pro Phe
                85                  90                  95

Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu Phe Met Gly
            100                 105                 110

Lys Val Val Asn Pro Thr Gln Lys
        115                 120
```

<210> 116
<211> 154
<212> PRT
<213> Homo sapiens

<400> 116

Met Ala Asp Asp Leu Asp Phe Glu Thr Gly Asp Ala Gly Ala Ser Ala
1 5 10 15

Thr Phe Pro Met Gln Cys Ser Ala Leu Arg Lys Asn Gly Phe Val Val
20 25 30

Leu Lys Gly Arg Pro Cys Lys Ile Val Glu Met Ser Thr Ser Lys Thr
35 40 45

Gly Lys His Gly His Ala Lys Val His Leu Val Gly Ile Asp Ile Phe
50 55 60

Thr Gly Lys Lys Tyr Glu Asp Ile Cys Pro Ser Thr His Asn Met Asp
65 70 75 80

Val Pro Asn Ile Lys Arg Asn Asp Phe Gln Leu Ile Gly Ile Gln Asp
85 90 95

Gly Tyr Leu Ser Leu Leu Gln Asp Ser Gly Glu Val Arg Glu Asp Leu
100 105 110

Arg Leu Pro Glu Gly Asp Leu Gly Lys Glu Ile Glu Gln Lys Tyr Asp
115 120 125

Cys Gly Glu Glu Ile Leu Ile Thr Val Leu Ser Ala Met Thr Glu Glu
130 135 140

Ala Ala Val Ala Ile Lys Ala Met Ala Lys
145 150

<210> 117
<211> 519
<212> PRT
<213> Homo sapiens

<400> 117

Met Asp Ala Val Leu Glu Pro Phe Pro Ala Asp Arg Leu Phe Pro Gly
1 5 10 15

Ser Ser Phe Leu Asp Leu Gly Asp Leu Asn Glu Ser Asp Phe Leu Asn

```
            20                  25                  30

Asn Ala His Phe Pro Glu His Leu Asp His Phe Thr Glu Asn Met Glu
        35                  40                  45

Asp Phe Ser Asn Asp Leu Phe Ser Ser Phe Phe Asp Asp Pro Val Leu
    50                  55                  60

Asp Glu Lys Ser Pro Leu Leu Asp Met Glu Leu Asp Ser Pro Thr Pro
65                  70                  75                  80

Gly Ile Gln Ala Glu His Ser Tyr Ser Leu Ser Gly Asp Ser Ala Pro
                85                  90                  95

Gln Ser Pro Leu Val Pro Ile Lys Met Glu Asp Thr Thr Gln Asp Ala
            100                 105                 110

Glu His Gly Ala Trp Ala Leu Gly His Lys Leu Cys Ser Ile Met Val
        115                 120                 125

Lys Gln Glu Gln Ser Pro Glu Leu Pro Val Asp Pro Leu Ala Ala Pro
    130                 135                 140

Ser Ala Met Ala Ala Ala Ala Ala Met Ala Thr Thr Pro Leu Leu Gly
145                 150                 155                 160

Leu Ser Pro Leu Ser Arg Leu Pro Ile Pro His Gln Ala Pro Gly Glu
                165                 170                 175

Met Thr Gln Leu Pro Val Ile Lys Ala Glu Pro Leu Glu Val Asn Gln
            180                 185                 190

Phe Leu Lys Val Thr Pro Glu Asp Leu Val Gln Met Pro Pro Thr Pro
        195                 200                 205

Pro Ser Ser His Gly Ser Asp Ser Asp Gly Ser Gln Ser Pro Arg Ser
    210                 215                 220

Leu Pro Pro Ser Ser Pro Val Arg Pro Met Ala Arg Ser Ser Thr Ala
225                 230                 235                 240

Ile Ser Thr Ser Pro Leu Leu Thr Ala Pro His Lys Leu Gln Gly Thr
                245                 250                 255

Ser Gly Pro Leu Leu Leu Thr Glu Glu Glu Lys Arg Thr Leu Ile Ala
            260                 265                 270
```

```
Glu Gly Tyr Pro Ile Pro Thr Lys Leu Pro Leu Thr Lys Ala Glu Glu
        275                 280                 285

Lys Ala Leu Lys Arg Val Arg Arg Lys Ile Lys Asn Lys Ile Ser Ala
    290                 295                 300

Gln Glu Ser Arg Arg Lys Lys Lys Glu Tyr Val Glu Cys Leu Glu Lys
305                 310                 315                 320

Lys Val Glu Thr Phe Thr Ser Glu Asn Asn Glu Leu Trp Lys Lys Val
                325                 330                 335

Glu Thr Leu Glu Asn Ala Asn Arg Thr Leu Leu Gln Gln Leu Gln Lys
            340                 345                 350

Leu Gln Thr Leu Val Thr Asn Lys Ile Ser Arg Pro Tyr Lys Met Ala
        355                 360                 365

Ala Thr Gln Thr Gly Thr Cys Leu Met Val Ala Ala Leu Cys Phe Val
    370                 375                 380

Leu Val Leu Gly Ser Leu Val Pro Cys Leu Pro Glu Phe Ser Ser Gly
385                 390                 395                 400

Ser Gln Thr Val Lys Glu Asp Pro Leu Ala Ala Asp Gly Val Tyr Thr
                405                 410                 415

Ala Ser Gln Met Pro Ser Arg Ser Leu Leu Phe Tyr Asp Asp Gly Ala
            420                 425                 430

Gly Leu Trp Glu Asp Gly Arg Ser Thr Leu Leu Pro Met Glu Pro Pro
        435                 440                 445

Asp Gly Trp Glu Ile Asn Pro Gly Gly Pro Ala Glu Gln Arg Pro Arg
    450                 455                 460

Asp His Leu Gln His Asp His Leu Asp Ser Thr His Glu Thr Thr Lys
465                 470                 475                 480

Tyr Leu Ser Glu Ala Trp Pro Lys Asp Gly Gly Asn Gly Thr Ser Pro
                485                 490                 495

Asp Phe Ser His Ser Lys Glu Trp Phe His Asp Arg Asp Leu Gly Pro
            500                 505                 510
```

Asn Thr Thr Ile Lys Leu Ser
515

<210> 118
<211> 534
<212> PRT
<213> Homo sapiens

<400> 118

Met Ala Thr Gly Leu Gln Val Pro Leu Pro Trp Leu Ala Thr Gly Leu
1 5 10 15

Leu Leu Leu Leu Ser Val Gln Pro Trp Ala Glu Ser Gly Lys Val Leu
20 25 30

Val Val Pro Ile Asp Gly Ser His Trp Leu Ser Met Arg Glu Val Leu
35 40 45

Arg Glu Leu His Ala Arg Gly His Gln Ala Val Val Leu Thr Pro Glu
50 55 60

Val Asn Met His Ile Lys Glu Glu Asn Phe Phe Thr Leu Thr Thr Tyr
65 70 75 80

Ala Ile Ser Trp Thr Gln Asp Glu Phe Asp Arg His Val Leu Gly His
85 90 95

Thr Gln Leu Tyr Phe Glu Thr Glu His Phe Leu Lys Lys Phe Phe Arg
100 105 110

Ser Met Ala Met Leu Asn Asn Met Ser Leu Val Tyr His Arg Ser Cys
115 120 125

Val Glu Leu Leu His Asn Glu Ala Leu Ile Arg His Leu Asn Ala Thr
130 135 140

Ser Phe Asp Val Val Leu Thr Asp Pro Val Asn Leu Cys Ala Ala Val
145 150 155 160

Leu Ala Lys Tyr Leu Ser Ile Pro Thr Val Phe Phe Leu Arg Asn Ile
165 170 175

Pro Cys Asp Leu Asp Phe Lys Gly Thr Gln Cys Pro Asn Pro Ser Ser
180 185 190

Tyr Ile Pro Arg Leu Leu Thr Thr Asn Ser Asp His Met Thr Phe Met

195 200 205

Gln Arg Val Lys Asn Met Leu Tyr Pro Leu Ala Leu Ser Tyr Ile Cys
210 215 220

His Ala Phe Ser Ala Pro Tyr Ala Ser Leu Ala Ser Glu Leu Phe Gln
225 230 235 240

Arg Glu Val Ser Val Val Asp Ile Leu Ser His Ala Ser Val Trp Leu
245 250 255

Phe Arg Gly Asp Phe Val Met Asp Tyr Pro Arg Pro Ile Met Pro Asn
260 265 270

Met Val Phe Ile Gly Gly Ile Asn Cys Ala Asn Arg Lys Pro Leu Ser
275 280 285

Gln Glu Phe Glu Ala Tyr Ile Asn Ala Ser Gly Glu His Gly Ile Val
290 295 300

Val Phe Ser Leu Gly Ser Met Val Ser Glu Ile Pro Glu Lys Lys Ala
305 310 315 320

Met Ala Ile Ala Asp Ala Leu Gly Lys Ile Pro Gln Thr Val Leu Trp
325 330 335

Arg Tyr Thr Gly Thr Arg Pro Ser Asn Leu Ala Asn Asn Thr Ile Leu
340 345 350

Val Lys Trp Leu Pro Gln Asn Asp Leu Leu Gly His Pro Met Thr Arg
355 360 365

Ala Phe Ile Thr His Ala Gly Ser His Gly Val Tyr Glu Ser Ile Cys
370 375 380

Asn Gly Val Pro Met Val Met Met Pro Leu Phe Gly Asp Gln Met Asp
385 390 395 400

Asn Ala Lys Arg Met Glu Thr Lys Gly Ala Gly Val Thr Leu Asn Val
405 410 415

Leu Glu Met Thr Ser Glu Asp Leu Glu Asn Ala Leu Lys Ala Val Ile
420 425 430

Asn Asp Lys Ser Tyr Lys Glu Asn Ile Met Arg Leu Ser Ser Leu His
435 440 445

```
Lys Asp Arg Pro Val Glu Pro Leu Asp Leu Ala Val Phe Trp Val Glu
    450                 455                 460

Phe Val Met Arg His Lys Gly Ala Pro His Leu Arg Pro Ala Ala His
465                 470                 475                 480

Asp Leu Thr Trp Tyr Gln Tyr His Ser Leu Asp Val Ile Gly Phe Leu
                485                 490                 495

Leu Ala Val Val Leu Thr Val Ala Phe Ile Thr Phe Lys Cys Cys Ala
            500                 505                 510

Tyr Gly Tyr Arg Lys Cys Leu Gly Lys Lys Gly Arg Val Lys Lys Ala
        515                 520                 525

His Lys Ser Lys Thr His
    530
```

<210> 119
<211> 185
<212> PRT
<213> Homo sapiens

<400> 119

```
Met Ala Met Glu Met Ile Gly Phe Phe Val Arg Leu Ser Ser Ser Leu
1               5                   10                  15

Leu Trp Phe Gln Ile Tyr Arg Leu Gly Ala Ala Ile Val Asp Thr Ser
            20                  25                  30

Leu Pro Arg Glu Thr Asp Ser Asp Leu Arg Asn Ser Phe Leu Asn Pro
        35                  40                  45

Pro Thr Pro Ala Ile Ala Arg Gln Cys Ser Gly Ala Glu Glu Ile Leu
    50                  55                  60

Gly Gly Ser Ile Tyr Asp Pro Ala Tyr Tyr Thr Ser Leu Phe Glu Glu
65                  70                  75                  80

Ser Gln Thr Asn Ile Asn Ser Pro Lys Ala Thr Gln Asp Val His Lys
                85                  90                  95

Thr Val Arg Ser Asp His Asn Val Val Ile Asn Asp Met Glu Glu Val
            100                 105                 110

Thr His Pro Met Gln Ile Leu Ser Pro Leu Cys Pro Leu Val Lys Arg
```

115 120 125

Ser Gly His Val Thr Lys Trp Asp Cys Ser Asn Thr Val Thr Thr Ser
130 135 140

Arg Ala Val His Glu Ile Pro Val Val Glu Phe Ile Arg Asn Phe Asn
145 150 155 160

Lys Thr Pro Tyr Ile Leu Asp Asp Leu Glu Arg Ala Pro Leu Trp Thr
165 170 175

Met Leu Phe Phe Gly Gly Asn His Lys
180 185

<210> 120
<211> 530
<212> PRT
<213> Homo sapiens

<400> 120

Met Ala Arg Ala Gly Trp Thr Ser Pro Val Pro Leu Cys Val Cys Leu
1 5 10 15

Leu Leu Thr Cys Gly Phe Ala Glu Ala Gly Lys Leu Leu Val Val Pro
20 25 30

Met Asp Gly Ser His Trp Phe Thr Met Gln Ser Val Val Glu Lys Leu
35 40 45

Ile Leu Arg Gly His Glu Val Val Val Val Met Pro Glu Val Ser Trp
50 55 60

Gln Leu Glu Arg Ser Leu Asn Cys Thr Val Lys Thr Tyr Ser Thr Ser
65 70 75 80

Tyr Thr Leu Glu Asp Gln Asn Arg Glu Phe Met Val Phe Ala His Ala
85 90 95

Gln Trp Lys Ala Gln Ala Gln Ser Ile Phe Ser Leu Leu Met Ser Ser
100 105 110

Ser Ser Gly Phe Leu Asp Leu Phe Phe Ser His Cys Arg Ser Leu Phe
115 120 125

Asn Asp Arg Lys Leu Val Glu Tyr Leu Lys Glu Ser Ser Phe Asp Ala
130 135 140

```
Val Phe Leu Asp Pro Phe Asp Thr Cys Gly Leu Ile Val Ala Lys Tyr
145                 150                 155                 160

Phe Ser Leu Pro Ser Val Val Phe Thr Arg Gly Ile Phe Cys His His
                165                 170                 175

Leu Glu Glu Gly Ala Gln Cys Pro Ala Pro Leu Ser Tyr Val Pro Asn
            180                 185                 190

Asp Leu Leu Gly Phe Ser Asp Ala Met Thr Phe Lys Glu Arg Val Trp
        195                 200                 205

Asn His Ile Val His Leu Glu Asp His Leu Phe Cys Gln Tyr Leu Phe
    210                 215                 220

Arg Asn Ala Leu Glu Ile Ala Ser Glu Ile Leu Gln Thr Pro Val Thr
225                 230                 235                 240

Ala Tyr Asp Leu Tyr Ser His Thr Ser Ile Trp Leu Leu Arg Thr Asp
                245                 250                 255

Phe Val Leu Asp Tyr Pro Lys Pro Val Met Pro Asn Met Ile Phe Ile
            260                 265                 270

Gly Gly Ile Asn Cys His Gln Gly Lys Pro Leu Pro Met Glu Phe Glu
        275                 280                 285

Ala Tyr Ile Asn Ala Ser Gly Glu His Gly Ile Val Val Phe Ser Leu
    290                 295                 300

Gly Ser Met Val Ser Glu Ile Pro Glu Lys Lys Ala Met Ala Ile Ala
305                 310                 315                 320

Asp Ala Leu Gly Lys Ile Pro Gln Thr Val Leu Trp Arg Tyr Thr Gly
                325                 330                 335

Thr Arg Pro Ser Asn Leu Ala Asn Asn Thr Ile Leu Val Lys Trp Leu
            340                 345                 350

Pro Gln Asn Asp Leu Leu Gly His Pro Met Thr Arg Ala Phe Ile Thr
        355                 360                 365

His Ala Gly Ser His Gly Val Tyr Glu Ser Ile Cys Asn Gly Val Pro
    370                 375                 380
```

Met Val Met Met Pro Leu Phe Gly Asp Gln Met Asp Asn Ala Lys Arg
385 390 395 400

Met Glu Thr Lys Gly Ala Gly Val Thr Leu Asn Val Leu Glu Met Thr
405 410 415

Ser Glu Asp Leu Glu Asn Ala Leu Lys Ala Val Ile Asn Asp Lys Ser
420 425 430

Tyr Lys Glu Asn Ile Met Arg Leu Ser Ser Leu His Lys Asp Arg Pro
435 440 445

Val Glu Pro Leu Asp Leu Ala Val Phe Trp Val Glu Phe Val Met Arg
450 455 460

His Lys Gly Ala Pro His Leu Arg Pro Ala Ala His Asp Leu Thr Trp
465 470 475 480

Tyr Gln Tyr His Ser Leu Asp Val Ile Gly Phe Leu Leu Ala Val Val
485 490 495

Leu Thr Val Ala Phe Ile Thr Phe Lys Cys Cys Ala Tyr Gly Tyr Arg
500 505 510

Lys Cys Leu Gly Lys Lys Gly Arg Val Lys Lys Ala His Lys Ser Lys
515 520 525

Thr His
530

<210> 121
<211> 533
<212> PRT
<213> Homo sapiens

<400> 121

Met Ala Val Glu Ser Gln Gly Gly Arg Pro Leu Val Leu Gly Leu Leu
1 5 10 15

Leu Cys Val Leu Gly Pro Val Val Ser His Ala Gly Lys Ile Leu Leu
20 25 30

Ile Pro Val Asp Gly Ser His Trp Leu Ser Met Leu Gly Ala Ile Gln
35 40 45

Gln Leu Gln Gln Arg Gly His Glu Ile Val Val Leu Ala Pro Asp Ala
50 55 60

```
Ser Leu Tyr Ile Arg Asp Gly Ala Phe Tyr Thr Leu Lys Thr Tyr Pro
65                  70                  75                  80

Val Pro Phe Gln Arg Glu Asp Val Lys Glu Ser Phe Val Ser Leu Gly
                85                  90                  95

His Asn Val Phe Glu Asn Asp Ser Phe Leu Gln Arg Val Ile Lys Thr
            100                 105                 110

Tyr Lys Lys Ile Lys Lys Asp Ser Ala Met Leu Leu Ser Gly Cys Ser
        115                 120                 125

His Leu Leu His Asn Lys Glu Leu Met Ala Ser Leu Ala Glu Ser Ser
    130                 135                 140

Phe Asp Val Met Leu Thr Asp Pro Phe Leu Pro Cys Ser Pro Ile Val
145                 150                 155                 160

Ala Gln Tyr Leu Ser Leu Pro Thr Val Phe Phe Leu His Ala Leu Pro
                165                 170                 175

Cys Ser Leu Glu Phe Glu Ala Thr Gln Cys Pro Asn Pro Phe Ser Tyr
            180                 185                 190

Val Pro Arg Pro Leu Ser Ser His Ser Asp His Met Thr Phe Leu Gln
        195                 200                 205

Arg Val Lys Asn Met Leu Ile Ala Phe Ser Gln Asn Phe Leu Cys Asp
    210                 215                 220

Val Val Tyr Ser Pro Tyr Ala Thr Leu Ala Ser Glu Phe Leu Gln Arg
225                 230                 235                 240

Glu Val Thr Val Gln Asp Leu Leu Ser Ser Ala Ser Val Trp Leu Phe
                245                 250                 255

Arg Ser Asp Phe Val Lys Asp Tyr Pro Arg Pro Ile Met Pro Asn Met
            260                 265                 270

Val Phe Val Gly Gly Ile Asn Cys Leu His Gln Asn Pro Leu Ser Gln
        275                 280                 285

Glu Phe Glu Ala Tyr Ile Asn Ala Ser Gly Glu His Gly Ile Val Val
    290                 295                 300
```

```
Phe Ser Leu Gly Ser Met Val Ser Glu Ile Pro Glu Lys Lys Ala Met
305                 310                 315                 320

Ala Ile Ala Asp Ala Leu Gly Lys Ile Pro Gln Thr Val Leu Trp Arg
                325                 330                 335

Tyr Thr Gly Thr Arg Pro Ser Asn Leu Ala Asn Asn Thr Ile Leu Val
            340                 345                 350

Lys Trp Leu Pro Gln Asn Asp Leu Leu Gly His Pro Met Thr Arg Ala
        355                 360                 365

Phe Ile Thr His Ala Gly Ser His Gly Val Tyr Glu Ser Ile Cys Asn
    370                 375                 380

Gly Val Pro Met Val Met Met Pro Leu Phe Gly Asp Gln Met Asp Asn
385                 390                 395                 400

Ala Lys Arg Met Glu Thr Lys Gly Ala Gly Val Thr Leu Asn Val Leu
                405                 410                 415

Glu Met Thr Ser Glu Asp Leu Glu Asn Ala Leu Lys Ala Val Ile Asn
            420                 425                 430

Asp Lys Ser Tyr Lys Glu Asn Ile Met Arg Leu Ser Ser Leu His Lys
        435                 440                 445

Asp Arg Pro Val Glu Pro Leu Asp Leu Ala Val Phe Trp Val Glu Phe
    450                 455                 460

Val Met Arg His Lys Gly Ala Pro His Leu Arg Pro Ala Ala His Asp
465                 470                 475                 480

Leu Thr Trp Tyr Gln Tyr His Ser Leu Asp Val Ile Gly Phe Leu Leu
                485                 490                 495

Ala Val Val Leu Thr Val Ala Phe Ile Thr Phe Lys Cys Cys Ala Tyr
            500                 505                 510

Gly Tyr Arg Lys Cys Leu Gly Lys Lys Gly Arg Val Lys Lys Ala His
        515                 520                 525

Lys Ser Lys Thr His
    530
```

<210> 122
<211> 318
<212> PRT
<213> Homo sapiens

<400> 122

Met Thr Ile Ser Val Glu Lys Pro Ile Phe Glu Glu Glu Val Ser Ala
1 5 10 15

Phe Glu Lys Ser Gly Asp Asn Ile Gly Glu Leu Lys Leu Asp Gly Gly
20 25 30

Phe Ser Met Pro Lys Met Asp Thr Asn Asp Asp Glu Ala Phe Leu Ala
35 40 45

Pro Glu Met Asn Ala Phe Gly Arg Gln Phe Arg Asp Tyr Asp Val Glu
50 55 60

Ser Glu Arg Gln Lys Gly Val Glu Glu Phe Tyr Arg Leu Gln His Ile
65 70 75 80

Asn Gln Thr Val Asp Phe Val Lys Lys Met Arg Ala Glu Tyr Gly Lys
85 90 95

Leu Asp Lys Met Val Met Ser Ile Trp Glu Cys Cys Glu Leu Leu Asn
100 105 110

Glu Val Val Asp Glu Ser Asp Pro Asp Leu Asp Glu Pro Gln Ile Gln
115 120 125

His Leu Leu Gln Ser Ala Glu Ala Ile Arg Lys Asp Tyr Pro Asn Glu
130 135 140

Asp Trp Leu His Leu Thr Ala Leu Ile His Asp Leu Gly Lys Val Ile
145 150 155 160

Thr Leu Pro Gln Phe Gly Gly Leu Pro Gln Trp Ala Val Val Gly Asp
165 170 175

Thr Phe Pro Val Gly Cys Ala Phe Asp Glu Ser Asn Val His His Lys
180 185 190

Tyr Phe Val Glu Asn Pro Asp Phe His Asn Glu Thr Tyr Asn Thr Lys
195 200 205

Asn Gly Ile Tyr Ser Glu Gly Cys Gly Leu Asn Asn Val Met Met Ser
210 215 220

```
Trp Gly His Asp Asp Tyr Met Tyr Leu Val Ala Lys Glu Asn Gly Ser
225                 230                 235                 240

Thr Leu Pro Ser Ala Gly Gln Phe Ile Ile Arg Tyr His Ser Phe Tyr
                245                 250                 255

Pro Leu His Thr Ala Gly Glu Tyr Thr His Leu Met Asn Glu Glu Asp
            260                 265                 270

Lys Glu Asn Leu Lys Trp Leu His Val Phe Asn Lys Tyr Asp Leu Tyr
        275                 280                 285

Ser Lys Ser Lys Val His Val Asp Val Glu Lys Val Lys Pro Tyr Tyr
    290                 295                 300

Met Ser Leu Ile Lys Lys Tyr Phe Pro Glu Asn Leu Arg Trp
305                 310                 315
```

<210> 123
<211> 111
<212> PRT
<213> Homo sapiens

<400> 123

```
Met Ala Asn Ile His Gln Glu Asn Glu Glu Met Glu Gln Pro Met Gln
1               5                   10                  15

Asn Gly Glu Glu Asp Arg Pro Leu Gly Gly Gly Glu Gly His Gln Pro
            20                  25                  30

Ala Gly Asn Arg Arg Gly Gln Ala Arg Arg Leu Ala Pro Asn Phe Arg
        35                  40                  45

Trp Ala Ile Pro Asn Arg Gln Ile Asn Asp Gly Met Gly Gly Asp Gly
    50                  55                  60

Asp Asp Met Glu Ile Phe Met Glu Glu Met Arg Glu Ile Arg Arg Lys
65                  70                  75                  80

Leu Arg Glu Leu Gln Leu Arg Asn Cys Leu Arg Ile Leu Met Gly Glu
                85                  90                  95

Leu Ser Asn His His Asp His His Asp Glu Phe Cys Leu Met Pro
            100                 105                 110
```

<210> 124
<211> 1516
<212> PRT
<213> Homo sapiens

<400> 124

```
Met Ala Pro Tyr Pro Cys Gly Cys His Ile Leu Leu Leu Leu Phe Cys
1               5                  10                  15

Cys Leu Ala Ala Ala Arg Ala Asn Leu Leu Asn Leu Asn Trp Leu Trp
            20                  25                  30

Phe Asn Asn Glu Asp Thr Ser His Ala Ala Thr Thr Ile Pro Glu Pro
        35                  40                  45

Gln Gly Pro Leu Pro Val Gln Pro Thr Ala Asp Thr Thr Thr His Val
    50                  55                  60

Thr Pro Arg Asn Gly Ser Thr Glu Pro Ala Thr Ala Pro Gly Ser Pro
65                  70                  75                  80

Glu Pro Pro Ser Glu Leu Leu Glu Asp Gly Gln Asp Thr Pro Thr Ser
                85                  90                  95

Ala Glu Ser Pro Asp Ala Pro Glu Glu Asn Ile Ala Gly Val Gly Ala
            100                 105                 110

Glu Ile Leu Asn Val Ala Lys Gly Ile Arg Ser Phe Val Gln Leu Trp
        115                 120                 125

Asn Asp Thr Val Pro Thr Glu Ser Leu Ala Arg Ala Glu Thr Leu Val
    130                 135                 140

Leu Glu Thr Pro Val Gly Pro Leu Ala Leu Ala Gly Pro Ser Ser Thr
145                 150                 155                 160

Pro Gln Glu Asn Gly Thr Thr Leu Trp Pro Ser Arg Gly Ile Pro Ser
                165                 170                 175

Ser Pro Gly Ala His Thr Thr Glu Ala Gly Thr Leu Pro Ala Pro Thr
            180                 185                 190

Pro Ser Pro Pro Ser Leu Gly Arg Pro Trp Ala Pro Leu Thr Gly Pro
        195                 200                 205

Ser Val Pro Pro Pro Ser Ser Glu Arg Ile Ser Glu Glu Val Gly Leu
    210                 215                 220
```

```
Leu Gln Leu Leu Gly Asp Pro Pro Pro Gln Gln Val Thr Gln Thr Asp
225                 230                 235                 240

Asp Pro Asp Val Gly Leu Ala Tyr Val Phe Gly Pro Asp Ala Asn Ser
                245                 250                 255

Gly Gln Val Ala Arg Tyr His Phe Pro Ser Leu Phe Phe Arg Asp Phe
            260                 265                 270

Ser Leu Leu Phe His Ile Arg Pro Ala Thr Glu Gly Pro Gly Val Leu
        275                 280                 285

Phe Ala Ile Thr Asp Ser Ala Gln Ala Met Val Leu Leu Gly Val Lys
    290                 295                 300

Leu Ser Gly Val Gln Asp Gly His Gln Asp Ile Ser Leu Leu Tyr Thr
305                 310                 315                 320

Glu Pro Gly Ala Gly Gln Thr His Thr Ala Ala Ser Phe Arg Leu Pro
                325                 330                 335

Ala Phe Val Gly Gln Trp Thr His Leu Ala Leu Ser Val Ala Gly Gly
            340                 345                 350

Phe Val Ala Leu Tyr Val Asp Cys Glu Glu Phe Gln Arg Met Pro Leu
        355                 360                 365

Ala Arg Ser Ser Arg Gly Leu Glu Leu Glu Pro Gly Ala Gly Leu Phe
    370                 375                 380

Val Ala Gln Ala Gly Gly Ala Asp Pro Asp Lys Phe Gln Gly Val Ile
385                 390                 395                 400

Ala Glu Leu Lys Val Arg Arg Asp Pro Gln Val Ser Pro Met His Cys
                405                 410                 415

Leu Asp Glu Glu Gly Asp Asp Ser Asp Gly Ala Phe Gly Asp Ser Gly
            420                 425                 430

Ser Gly Leu Gly Asp Ala Arg Glu Leu Leu Arg Glu Glu Thr Gly Ala
        435                 440                 445

Ala Leu Lys Pro Arg Leu Pro Ala Pro Pro Pro Val Thr Thr Pro Pro
    450                 455                 460
```

```
Leu Ala Gly Gly Ser Ser Thr Glu Asp Ser Arg Ser Glu Glu Val Glu
465                 470                 475                 480

Glu Gln Thr Thr Val Ala Ser Leu Gly Ala Gln Thr Leu Pro Gly Ser
                485                 490                 495

Asp Ser Val Ser Thr Trp Asp Gly Ser Val Arg Thr Pro Gly Gly Arg
            500                 505                 510

Val Lys Glu Gly Gly Leu Lys Gly Gln Lys Gly Glu Pro Gly Val Pro
        515                 520                 525

Gly Pro Pro Gly Arg Ala Gly Pro Pro Gly Ser Pro Cys Leu Pro Gly
    530                 535                 540

Pro Pro Gly Leu Pro Cys Pro Val Ser Pro Leu Gly Pro Ala Gly Pro
545                 550                 555                 560

Ala Leu Gln Thr Val Pro Gly Pro Gln Gly Pro Pro Gly Pro Pro Gly
                565                 570                 575

Arg Asp Gly Thr Pro Gly Arg Asp Gly Glu Pro Gly Asp Pro Gly Glu
            580                 585                 590

Asp Gly Lys Pro Gly Asp Thr Gly Pro Gln Gly Phe Pro Gly Thr Pro
        595                 600                 605

Gly Asp Val Gly Pro Lys Gly Asp Lys Gly Asp Pro Gly Val Gly Glu
    610                 615                 620

Arg Gly Pro Pro Gly Pro Gln Gly Pro Pro Gly Pro Pro Gly Pro Ser
625                 630                 635                 640

Phe Arg His Asp Lys Leu Thr Phe Ile Asp Met Glu Gly Ser Gly Phe
                645                 650                 655

Gly Gly Asp Leu Glu Ala Leu Arg Gly Pro Arg Gly Phe Pro Gly Pro
            660                 665                 670

Pro Gly Pro Pro Gly Val Pro Gly Leu Pro Gly Glu Pro Gly Arg Phe
        675                 680                 685

Gly Val Asn Ser Ser Asp Val Pro Gly Pro Ala Gly Leu Pro Gly Val
    690                 695                 700
```

```
Pro Gly Arg Glu Gly Pro Pro Gly Phe Pro Gly Leu Pro Gly Pro Pro
705                 710                 715                 720

Gly Pro Pro Gly Arg Glu Gly Pro Pro Gly Arg Thr Gly Gln Lys Gly
                725                 730                 735

Ser Leu Gly Glu Ala Gly Ala Pro Gly His Lys Gly Ser Lys Gly Ala
            740                 745                 750

Pro Gly Pro Ala Gly Ala Arg Gly Glu Ser Gly Leu Ala Gly Ala Pro
        755                 760                 765

Gly Pro Ala Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
    770                 775                 780

Pro Gly Leu Pro Ala Gly Phe Asp Asp Met Glu Gly Ser Gly Gly Pro
785                 790                 795                 800

Phe Trp Ser Thr Ala Arg Ser Ala Asp Gly Pro Gln Gly Pro Pro Gly
                805                 810                 815

Leu Pro Gly Leu Lys Gly Asp Pro Gly Val Pro Gly Leu Pro Gly Ala
            820                 825                 830

Lys Gly Glu Val Gly Ala Asp Gly Ile Pro Gly Phe Pro Gly Leu Pro
        835                 840                 845

Gly Arg Glu Gly Ile Ala Gly Pro Gln Gly Pro Lys Gly Asp Arg Gly
    850                 855                 860

Ser Arg Gly Glu Lys Gly Asp Pro Gly Lys Asp Gly Val Gly Gln Pro
865                 870                 875                 880

Gly Leu Pro Gly Pro Pro Gly Pro Pro Gly Pro Val Val Tyr Val Ser
                885                 890                 895

Glu Gln Asp Gly Ser Val Leu Ser Val Pro Gly Pro Glu Gly Arg Pro
            900                 905                 910

Gly Phe Ala Gly Phe Pro Gly Pro Ala Gly Pro Lys Gly Asn Leu Gly
        915                 920                 925

Ser Lys Gly Glu Arg Gly Ser Pro Gly Pro Lys Gly Glu Lys Gly Glu
    930                 935                 940

Pro Gly Ser Ile Phe Ser Pro Asp Gly Gly Ala Leu Gly Pro Ala Gln
```

945 950 955 960

Lys Gly Ala Lys Gly Glu Pro Gly Phe Arg Gly Pro Pro Gly Pro Tyr
965 970 975

Gly Arg Pro Gly Tyr Lys Gly Glu Ile Gly Phe Pro Gly Arg Pro Gly
980 985 990

Arg Pro Gly Met Asn Gly Leu Lys Gly Glu Lys Gly Glu Pro Gly Asp
995 1000 1005

Ala Ser Leu Gly Phe Gly Met Arg Gly Met Pro Gly Pro Pro Gly
1010 1015 1020

Pro Pro Gly Pro Pro Gly Pro Pro Gly Thr Pro Val Tyr Asp Ser
1025 1030 1035

Asn Val Phe Ala Glu Ser Ser Arg Pro Gly Pro Pro Gly Leu Pro
1040 1045 1050

Gly Asn Gln Gly Pro Pro Gly Pro Lys Gly Ala Lys Gly Glu Val
1055 1060 1065

Gly Pro Pro Gly Pro Pro Gly Gln Phe Pro Phe Asp Phe Leu Gln
1070 1075 1080

Leu Glu Ala Glu Met Lys Gly Glu Lys Gly Asp Arg Gly Asp Ala
1085 1090 1095

Gly Gln Lys Gly Glu Arg Gly Glu Pro Gly Gly Gly Gly Phe Phe
1100 1105 1110

Gly Ser Ser Leu Pro Gly Pro Pro Gly Pro Pro Gly Pro Arg Gly
1115 1120 1125

Tyr Pro Gly Ile Pro Gly Pro Lys Gly Glu Ser Ile Arg Gly Gln
1130 1135 1140

Pro Gly Pro Pro Gly Pro Gln Gly Pro Pro Gly Ile Gly Tyr Glu
1145 1150 1155

Gly Arg Gln Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro
1160 1165 1170

Ser Phe Pro Gly Pro His Arg Gln Thr Ile Ser Val Pro Gly Pro
1175 1180 1185

```
Pro Gly  Pro Pro Gly Pro Pro  Gly Pro Pro Gly Thr  Met Gly Ala
    1190                 1195                 1200

Ser Ser  Gly Val Arg Leu Trp  Ala Thr Arg Gln Ala  Met Leu Gly
    1205                 1210                 1215

Gln Val  His Glu Val Pro Glu  Gly Trp Leu Ile Phe  Val Ala Glu
    1220                 1225                 1230

Gln Glu  Glu Leu Tyr Val Arg  Val Gln Asn Gly Phe  Arg Lys Val
    1235                 1240                 1245

Gln Leu  Glu Ala Arg Thr Pro  Leu Pro Arg Gly Thr  Asp Asn Glu
    1250                 1255                 1260

Val Ala  Ala Leu Gln Pro Pro  Val Val Gln Leu His  Asp Ser Asn
    1265                 1270                 1275

Pro Tyr  Pro Arg Arg Glu His  Pro His Pro Thr Ala  Arg Pro Trp
    1280                 1285                 1290

Arg Ala  Asp Asp Ile Leu Ala  Ser Pro Pro Arg Leu  Pro Glu Pro
    1295                 1300                 1305

Gln Pro  Tyr Pro Gly Ala Pro  His His Ser Ser Tyr  Val His Leu
    1310                 1315                 1320

Arg Pro  Ala Arg Pro Thr Ser  Pro Pro Ala His Ser  His Arg Asp
    1325                 1330                 1335

Phe Gln  Pro Val Leu His Leu  Val Ala Leu Asn Ser  Pro Leu Ser
    1340                 1345                 1350

Gly Gly  Met Arg Gly Ile Arg  Gly Ala Asp Phe Gln  Cys Phe Gln
    1355                 1360                 1365

Gln Ala  Arg Ala Val Gly Leu  Ala Gly Thr Phe Arg  Ala Phe Leu
    1370                 1375                 1380

Ser Ser  Arg Leu Gln Asp Leu  Tyr Ser Ile Val Arg  Arg Ala Asp
    1385                 1390                 1395

Arg Ala  Ala Val Pro Ile Val  Asn Leu Lys Asp Glu  Leu Leu Phe
    1400                 1405                 1410
```

```
Pro Ser  Trp Glu Ala Leu Phe  Ser Gly Ser Glu Gly  Pro Leu Lys
    1415                 1420                 1425

Pro Gly  Ala Arg Ile Phe Ser  Phe Asp Gly Lys Asp  Val Leu Arg
    1430                 1435                 1440

His Pro  Thr Trp Pro Gln Lys  Ser Val Trp His Gly  Ser Asp Pro
    1445                 1450                 1455

Asn Gly  Arg Arg Leu Thr Glu  Ser Tyr Cys Glu Thr  Trp Arg Thr
    1460                 1465                 1470

Glu Ala  Pro Ser Ala Thr Gly  Gln Ala Ser Ser Leu  Leu Gly Gly
    1475                 1480                 1485

Arg Leu  Leu Gly Gln Ser Ala  Ala Ser Cys His His  Ala Tyr Ile
    1490                 1495                 1500

Val Leu  Cys Ile Glu Asn Ser  Phe Met Thr Ala Ser  Lys
    1505                 1510                 1515
```

<210> 125
<211> 684
<212> PRT
<213> Homo sapiens

<400> 125

```
Met Ala Gly Pro Arg Ala Cys Ala Pro Leu Leu Leu Leu Leu Leu Leu
1               5                  10                  15

Gly Gln Leu Leu Ala Ala Ala Gly Ala Gln Arg Val Gly Leu Pro Gly
            20                  25                  30

Pro Pro Gly Pro Pro Gly Arg Pro Gly Lys Pro Gly Gln Asp Gly Ile
        35                  40                  45

Asp Gly Glu Ala Gly Pro Pro Gly Leu Pro Gly Pro Pro Gly Pro Lys
    50                  55                  60

Gly Ala Pro Gly Lys Pro Gly Lys Pro Gly Glu Ala Gly Leu Pro Gly
65                  70                  75                  80

Leu Pro Gly Val Asp Gly Leu Thr Gly Arg Asp Gly Pro Pro Gly Pro
                85                  90                  95

Lys Gly Ala Pro Gly Glu Arg Gly Ser Leu Gly Pro Pro Gly Pro Pro
```

100 105 110

Gly Leu Gly Gly Lys Gly Leu Pro Gly Pro Pro Gly Glu Ala Gly Val
115 120 125

Ser Gly Pro Pro Gly Gly Ile Gly Leu Arg Gly Pro Pro Gly Pro Pro
130 135 140

Gly Leu Pro Gly Leu Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
145 150 155 160

His Pro Gly Val Leu Pro Glu Gly Ala Thr Asp Leu Gln Cys Pro Ser
165 170 175

Ile Cys Pro Pro Gly Pro Pro Gly Pro Pro Gly Met Pro Gly Phe Lys
180 185 190

Gly Pro Thr Gly Tyr Lys Gly Glu Gln Gly Glu Val Gly Lys Asp Gly
195 200 205

Glu Lys Gly Asp Pro Gly Pro Pro Gly Pro Ala Gly Leu Pro Gly Ser
210 215 220

Val Gly Leu Gln Gly Pro Arg Gly Leu Arg Gly Leu Pro Gly Pro Leu
225 230 235 240

Gly Pro Pro Gly Asp Arg Gly Pro Ile Gly Phe Arg Gly Pro Pro Gly
245 250 255

Ile Pro Gly Ala Pro Gly Lys Ala Gly Asp Arg Gly Glu Arg Gly Pro
260 265 270

Glu Gly Phe Arg Gly Pro Lys Gly Asp Leu Gly Arg Pro Gly Pro Lys
275 280 285

Gly Thr Pro Gly Val Ala Gly Pro Ser Gly Glu Pro Gly Met Pro Gly
290 295 300

Lys Asp Gly Gln Asn Gly Val Pro Gly Leu Asp Gly Gln Lys Gly Glu
305 310 315 320

Ala Gly Arg Asn Gly Ala Pro Gly Glu Lys Gly Pro Asn Gly Leu Pro
325 330 335

Gly Leu Pro Gly Arg Ala Gly Ser Lys Gly Glu Lys Gly Glu Arg Gly
340 345 350

```
Arg Ala Gly Glu Leu Gly Glu Ala Gly Pro Ser Gly Glu Pro Gly Val
        355                 360                 365

Pro Gly Asp Ala Gly Met Pro Gly Glu Arg Gly Glu Ala Gly His Arg
    370                 375                 380

Gly Ser Ala Gly Ala Leu Gly Pro Gln Gly Pro Pro Gly Ala Pro Gly
385                 390                 395                 400

Val Arg Gly Phe Gln Gly Gln Lys Gly Ser Met Gly Asp Pro Gly Leu
                405                 410                 415

Pro Gly Pro Gln Gly Leu Arg Gly Asp Val Gly Asp Arg Gly Pro Gly
            420                 425                 430

Gly Ala Glu Gly Pro Lys Gly Asp Gln Gly Ile Ala Gly Ser Asp Gly
        435                 440                 445

Leu Pro Gly Asp Lys Gly Glu Leu Gly Pro Ser Gly Leu Val Gly Pro
    450                 455                 460

Lys Gly Glu Ser Gly Ser Arg Gly Glu Leu Gly Pro Lys Gly Thr Gln
465                 470                 475                 480

Gly Pro Asn Gly Thr Ser Gly Val Gln Gly Val Pro Gly Pro Pro Gly
                485                 490                 495

Pro Leu Gly Leu Gln Gly Val Pro Gly Val Pro Gly Ile Thr Gly Lys
            500                 505                 510

Pro Gly Val Pro Gly Lys Glu Ala Ser Glu Gln Arg Ile Arg Glu Leu
        515                 520                 525

Cys Gly Gly Met Ile Ser Glu Gln Ile Ala Gln Leu Ala Ala His Leu
    530                 535                 540

Arg Lys Pro Leu Ala Pro Gly Ser Ile Gly Arg Pro Gly Pro Ala Gly
545                 550                 555                 560

Pro Pro Gly Pro Pro Gly Pro Pro Gly Ser Ile Gly His Pro Gly Ala
                565                 570                 575

Arg Gly Pro Pro Gly Tyr Arg Gly Pro Thr Gly Glu Leu Gly Asp Pro
            580                 585                 590
```

```
Gly Pro Arg Gly Asn Gln Gly Asp Arg Gly Asp Lys Gly Ala Ala Gly
        595                 600                 605

Ala Gly Leu Asp Gly Pro Glu Gly Asp Gln Gly Pro Gln Gly Pro Gln
    610                 615                 620

Gly Val Pro Gly Thr Ser Lys Asp Gly Gln Asp Gly Ala Pro Gly Glu
625                 630                 635                 640

Pro Gly Pro Pro Gly Asp Pro Gly Leu Pro Gly Ala Ile Gly Ala Gln
                645                 650                 655

Gly Thr Pro Gly Ile Cys Asp Thr Ser Ala Cys Gln Gly Ala Val Leu
            660                 665                 670

Gly Gly Val Gly Glu Lys Ser Gly Ser Arg Ser Ser
        675                 680
```